Negotiations of Acknowledgement among Middle Class Residents

An Analysis of Post Disaster Interactions and Performance in a Danish Context

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Inter-Related Effects due to Droughts for Rural Populations: A Qualitative Field Study for Farmers in Iran

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Abstract

This paper provides in-depth information on the multiple realities and time-dependencies during droughts over different sub-groups of an affected society. Dynamics are analyzed based on categorization of impacts into human, social, financial and natural capital effects and using the theory of conservation of resources for the behavioral explanation of selected coping strategies. A qualitative field study based on this approach was conducted in a village in southern Iran. It was found that droughts can cause waves of negative effects on various capital dimensions to farmers, especially the poor. The dimensions are very much interrelated and can multiply negative effects, decreasing resilience to drought to very low levels that can eventually lead to poverty trap-like situations. Furthermore, it was found that government aid interventions unintendedly worsened the situation of the poor. To avoid such situations it is suggested to shift from relief or ex-post interventions to a proactive risk management approach.

Keywords: Drought effects, farmers, household level, inter-related effects, qualitative study, Iran.

Introduction

Drought is a recurring climatic event that can happen in all parts of the world. In terms of people affected, it is the number one risk of all natural hazards, with more than 1 billion people affected in the last decade (World Disaster Report 2010). This situation is likely to worsen in the future, with an already observed increase in droughts and predicted increases in extreme droughts in the future due to climate change (Schneider et al. 2007). For example, the frequency of exceptionally hot years has significantly increased in Australia and this trend is projected to continue (Hennessy et al. 2008). Iran, the study region in this paper, expects negative climate change impacts, especially in the agriculture sector, e.g. significant reduction in rainfed wheat yield (Nasiri et al. 2006). However, the effects of droughts to human society depend not only on the severity of the event (such as lack of rainfall) but also on the resources the society and its members have to cope with this shock. Such resources can include formal market mechanisms as well as informal/traditional ones, e.g. from crop insurance to kinship arrangements (see Skoufias 2003 for a comprehensive list). Consequently, dependent on the coping strategies available, the short and long term effects may differ greatly among sub-groups within the affected population. Additionally, the action taken by one sub-group to cope with the event may have important implications for other groups as well. Furthermore, the actions of one group and the implications for another group may not be necessarily on the same dimension (e.g., financial or social) and can cause devastating negative feedback loops. It is the primary goal in this paper to shed more light on these interrelationships and negative feedback loops during a drought.

While it is recognized in the literature that droughts and strategies to lessen the impacts have to be analyzed from a broad based perspective, i.e., including psychological, economic, sociological and institutional dimensions (see Campbell et al. 2011; Easdale and Rosso 2010; Gilbert and McLeman 2010; Edwards et al. 2009; Eriksen and Silva 2009; Wilhite 2002; McKee et al. 2002; Paul 1998), most existing research tends to focus only on certain dimensions. Sometimes the focal point is on economic consequences (Edwards et al. 2009; Horridge et al. 2005; Mahul et al. 2005; Paul 1998), whereas others focus on environmental effects (Speranza et al. 2008) or agricultural adjustments within sustainability frameworks (Ha et al. 2007), with only a few addressing detailed social (see Gilbert and McLeman 2010; McAllister et al. 2008) or psychological adjustments (Coelho et al. 2004). However, interrelated and dynamic (time-dependent) effects among those dimensions (and within sub-groups of the affected population) may play a more important role than assumed in the past and therefore should not be neglected, as they can be long lasting. For example, school dropouts due to a drought (Eriksen et al. 2005) can cause serious negative long term consequences as education is now recognized as an important element for development (Crespo and Lutz 2007; Lutz et al. 2007, 2008). The possibility of dropping out of school, as well as other socio-

economic dynamics during a drought may differ greatly among household groups (Hochrainer et al. 2009; Mechler et al. 2009). Furthermore, attitudes of farmers toward drought and drought management are closely linked with their behavioral management and experience with past events (Zarafshani et al. 2005; Zarafshani et al. 2007; Lindell and Perry 2004). Hence, attitude and past experience can affect the assessment of coping strategies in the future, which is especially important from a preventive action point of view (see Krömker and Mosler 2002). From a (quantitative) modelling perspective, knowledge of time-dependencies over different dimensions and sub-groups is important and should be explicitly incorporated to determine suitable coping and risk management strategies, especially for the poor (Barrett et al. 2007).

Generally speaking, while detailed large scale analyses of social and economic impacts of drought on farmers (and households) in regional, rural, and urban areas are necessary (see for example Edwards et al. 2008), there is also a need to better understand the dynamics during the drought. If this is neglected, not only is the "disaster landscape" of the drought incomplete, but policy solutions may be inadequate or even exacerbate the problem for some sub-groups. However, to assess these dynamics and interactions between human, economic and social dimensions, qualitative rather than quantitative approaches seem to be appropriate. Hence, a qualitative study was conducted to find in-depth information on the multiple realities and dynamics during droughts including social, economic and human/psychological related consequences over different sub-groups of the effected population. The chosen study site is a village in southern Iran where drought has been a recurring phenomenon in the past and farmers continually cope with high rainfall variability (Foltz 2002). The paper is organized as follows. The next section presents the theoretical framework used for the case study. Afterwards, in section 3 the case study site is introduced. Section 4 presents the detailed results and section 5 ends with a conclusion.

Framework

Household level effects due to droughts can be multidimensional and are dependent on the availability of relevant coping strategies (Zarafshani et al. 2005; Zarafshani et al. 2007; Ingram et al. 2002). Important variables in that regard include dimensions such as household structure, gender, education, property features, condition and size of farm, educational level of household members, as well as financial and economic conditions (Speranza et al. 2008; McIntire 1991). The combination of these and related variables will make some people more vulnerable than others in the face of extreme events (Paul 1998). The poor especially tend to be exposed to environmental risk more than the wealthy, as the latter are better able to take protective measures and can avoid some environmental risks completely—e.g., health or psychological related risk (Brouwer et al. 2007).

To avoid confusion between the different interrelated effects, we separate them into different kinds of "capital". In more detail, we use the "four capitals" framework (Australian Bureau of Statistics 2001; Australian Bureau of Statistics 2002) to define household and community resilience due to droughts. Such frameworks (and as a part of larger frameworks such as the sustainable livelihood approach, see DFID 1999) proved successful in a number of past studies in identifying conditions that either promote or hinder resilience and therefore should also serve well here. Consequently, household resilience and its dynamics are assessed and investigated in relation to levels of various stocks within the four available capitals and their changes over time (Australian Bureau of Statistics 2004; McIntosh 2008). The definitions for each type of capital are given below.

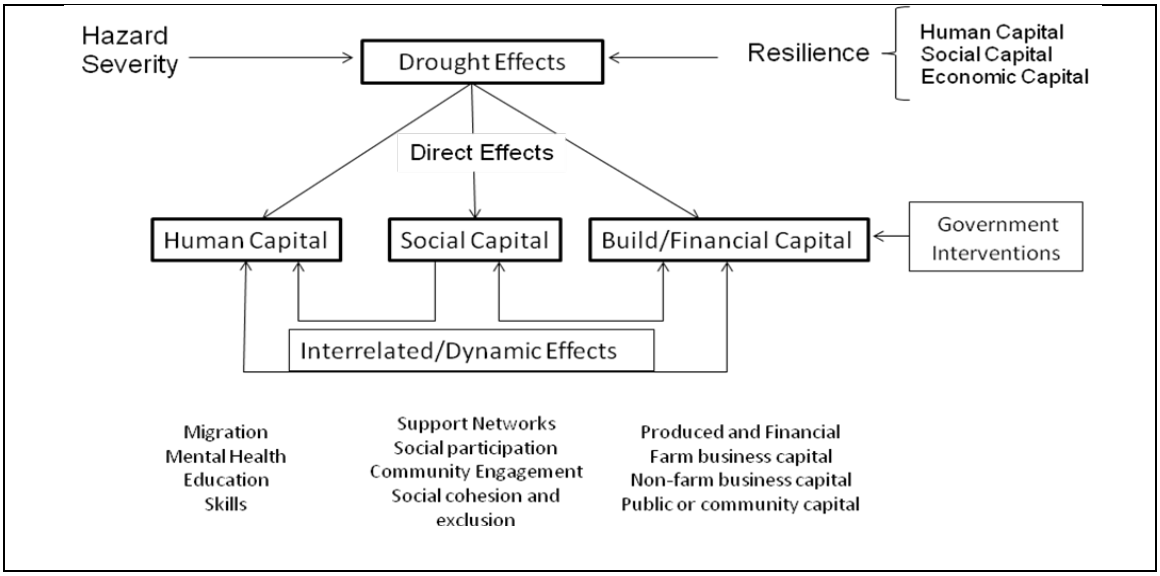
- Human Capital: Refers to the knowledge, skills, competencies and general capacities of individuals. The focus here is on capacities of individuals.
- Social Capital: Refers to networks, features of social organization, such as norms, values, trust and understanding that facilitate co-operation. Here, the focus is on capacities of groups.
- Built and Financial Capital: Refers to the built environment and anything that has been made by human hands, including the physical assets of the private and public sector. Financial capital refers to the funds (money) that are available to individuals and groups.
- Natural Capital: Refers to renewable and non-renewable resources of the bio-physical systems of a region or community, which enter the production process and satisfy consumption needs.

To explain the dynamics of resilience due to the "actions" of different kinds of risk bearers to cope with the drought, we use the so-called "Conservation of Resources Theory"(COR—Hobfoll 1988, 2001). COR provides a behavioral explanation of the decisions made during the drought. It is a motivational stress theory based on the hypothesis that people have a desire to conserve their resources and to limit any state that may jeopardize the security of these resources. Accordingly, if resources are threatened, lost or one fails to gain resources after investments, this will lead to mental or physical stress outcomes. Three premises can be outlined in COR relevant in our study. First, (acute) resource loss is central to the stress process. Second, people invest in resources to protect themselves against resource loss, to recover from loss, and to gain resources. Third, those who lack resources are more vulnerable to resource loss (eventually leading to loss spirals).

Several studies on the household, community, and national level can be found in the literature using similar kinds of approaches (for a literature review on droughts see Zamani et al. 2006). However, explanation of time-dependent interactions between

household sub-groups as well as the community level over time is lacking. This paper should fill part of this gap by analyzing the process in detail. Furthermore, direct and interrelated effects are distinguished, so that the dynamics can be separated into the different capitals (Figure 1). We excluded natural capital as this is assumed to be constant in our analysis, i.e., the same environmental conditions (droughts are not spatial limited events and happen over large regions). Note that this may not hold true in the context of climate change.

Figure 1: Framework for the Analysis of Household Effects



As Figure 1 shows, in our approach drought effects are dependent on the hazard severity (e.g., lack of rainfall) and the resilience of the household to this shock. Resilience is determined by the level of available capital stock to cope with the event. This will have direct effects on the capital stocks and over time there are additional interrelated effects (possible feedback loops) between those forms of capitals. Furthermore, government interventions can come into play, additionally changing the system and affecting the households' resilience.

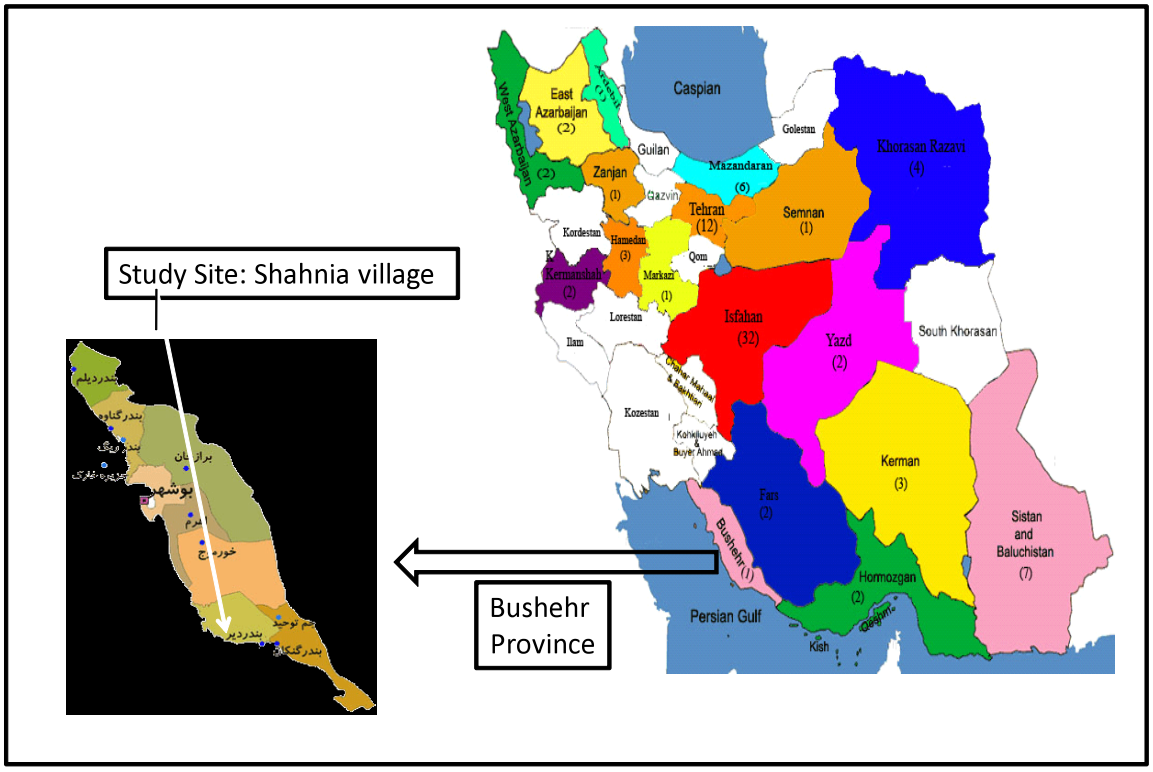
Methodology

Study Population

The Shahnia village in the Boushehr province in southern Iran (Figure 2) was chosen as the study site. Geographically, it is near the Persian Gulf (about 20 km away) and a river (the Mond) is about 2 km north to the village. The total number of households is around 236 with a total population of about 1,300 people. The village is very susceptible to rainfall shortages and has experienced several droughts in the past. The major soil type

in this area is sandy loam, which has soil moisture inadequate to meet the needs of any particular crop. Wheat and tomato are the main crops cultivated there. Specific varieties of rainfed wheat are selected at the beginning of the season dependent on actual precipitation. Farmers cultivate Chamran wheat in normal times, but they use Zagros or Koohdasht wheat if there is less precipitation at the beginning of the season (for a drought tolerance comparison of this kind of wheat varieties see Azimzadeh and Azimzadeh 2011).

Figure 2: Location of the Study Site in Iran



Only owners of agricultural land (irrigated or rainfed) were selected as potential candidates to be included in the study. The interviews were conducted during the drought in 2009. The interviewer was from this area and therefore was very experienced in the language, religion, culture and customs of the farmers there. This was seen as an important advantage for interpreting the responses, as there were no language barriers and a better understanding of feelings and emotions beyond words was obtained, which is essential for capturing multiple realities and *emic* perspectives (Fetterman 1989). Audio tapes were not used, as it was known via pre-tests that the respondents were not comfortable with this method of data collection and would have very likely resulted in

biased responses. However, all dialogues were well documented afterwards (Varjas et al. 2005).

Interviews

In-depth unstructured interviews and participatory observations were applied to gather the data. In that way, a comprehensive discussion between the two sides happened naturally over the course of the interview, allowing for the collection of valuable information about farmer's daily life and experience in droughts.

Sampling Procedure

In contrast to quantitative research sampling approaches, qualitative sampling is a selective and, thus non-probability, sampling approach (Popay et al. 1998). Hence, the sample size is deliberate and based on the research goal. We selected our cases using two different methods. At the beginning, we utilized key informants (i.e., persons who knew best what was going on in their communities). These people included community leaders (elected leaders), professionals (agriculture officers), and those who had firsthand knowledge about the community (Berg 2007). We asked the local informants to introduce us to some rich, moderate, and poor farmers in the drought-affected region. Additionally, we used a snowball sampling method (chain referral sampling in which current informants used their social networks to refer the researcher to others who might contribute to the study). Snowball sampling is often used to find and recruit 'hidden populations", that is, groups that are not easily accessible to researchers through other sampling strategies (Stahler and Cohen 2000). Finally, we selected 36 cases that were most frequently mentioned within both methods. We included a larger number of very poor farmers as they were expected to experience the most varied of effects. Hence, we selected 7 rich, 11 moderate, and 18 poor farmers and investigated their coping strategies and effects due to droughts.

Recruitment

Three to four interviews in various places were performed for each case. The first interview was always performed in the participant's house when he was alone, the second took place at his farm, the third in other places where he worked (shops, farms of wealthy farmers), and last in a group of friends. Although this method is very time-consuming, it has the advantage of assuring that the interviewer receives true information. For example, it was found that it's very likely that initially, the interviewed person mistrusted the interviewer—assuming that he/she was from a government agency—and as a result, may not have accurately responded to some questions. To overcome this barrier, more

interviews were carried out, potentially resulting in an increase in trust and enabling the interviewer to check the reliability of responses.

Results

Table 1 shows some of the socio-demographic variables for each of the three wealth classes.

Table 1. Socio-demographic Information of the Sample Cases: Mean Values, Standard Deviation in Brackets.

	Poor farmers (*N* = 18)	Moderate farmers (*N* = 11)	Rich farmers (*N* = 7)
Age	59 (7.1)	48 (6.5)	63 (5.8)
Education[1]	2.44	7	7
Family members	7.88 (2.8)	7.18 (2.1)	9.57 (3.2)
Rain land (in ha)	36 (15.6)	157.3 (214.1)	212.9 (54.9)
Irrigated land (in ha)	0.08 (0.19)	4.63 (4.17)	45.71 (28.2)
Garden (ha)	0	0.18 (0.34)	1.78 (1.72)
Agricultural tools used	No	Few needed assets	All assets needed
Main Second jobs	Wage	Shops, Taxi driver	Trade

[1] Number of years in School: 5 years= Primary School, 9 years= Secondary school, 12 years= High School

Next, we separate our analysis into the three types of capitals as shown in Figure 1—human capital, social capital, and built/financial capital. We always explicitly refer to the respondent's wealth class if there are differences compared to other wealth classes. The observations are explained using the COR theory introduced in section 2 and are summarized again at the end of the paper.

Built/Financial Capital Effects

All farmers believed that droughts severely affected their financial status. However, poor farmers suffered the most, as they had no crop yields in the last three years due to precipitation shortages. Hence, resilience was already very low. Crop diversification as one agricultural adjustment strategy (which can be seen as part of the resource investment premise within the COR theory) served well for some wealthier farmers. For example, two rich farmers and one moderate farmer believed that during a drought they were able to produce more tomatoes with better quality from their lands than in normal times. One farmer stated:

> When we have less rain, tomato products will be better because rain increases the probability of diseases. Also precipitation itself causes damages to plants.

Job opportunities, especially farm wage income, decreased during the drought. This affected the poor the most, as this was their main additional second income source. Hence, the decrease in financial capital of poor households during the drought was affected due to at least two reasons: Firstly, many poor farmers could not farm for themselves any longer as there was no available water for irrigation. Secondly, while in "normal" times poor farmers simultaneously worked on both their own plots and those of rich farmers (to earn additional money), during droughts they lost this alternative income source as well. A poor farmer stated:

> Good old years; when there was lots of rain; I worked on my own farm. My sons and I were busy working for other, too. Now I can't work for myself and only my elder son was lucky enough to catch a job in others' tomato farm.

Interestingly, government aid interventions worsened the situation of the poor in the long run. Basically, the Iranian government is concerned about its rural farmers during droughts and its intention is to manage drought and vulnerability in rural areas through economical and infrastructural aid such as offering loans, retrofitting canals, watershed management projects, establishing local dams and other supports for modern watering methods. However, only the rich and moderate farmers usually benefit from this kind of governmental emergency assistance (see also Brouwer et al. 2007; Paul 1998). Reasons for that include lack of knowledge and/or capacities to apply for loans, reflected in the following statements of poor farmers:

> I don't know anything about these loans. Even if I knew, it wouldn't matter; because loans are for the rich.

Another poor farmer said

> I don't have any official document of my own land nor a bailsman, I had been asked for it whenever I demanded to take a loan…I have none

One other noted that

> My lands are under dry farming. Loans are for the rich who owns a bore hole or sprinkle irrigation system.

Another continued

> My lands are far from rivers, so I can't retrieve water to irrigate. These loans don't suit me.

As could be expected, rich and moderate farmers were satisfied with governmental assistance. Some even believed to have benefited due to the drought. Their replies reflected satisfaction. For example,

> I took two kinds of loans. A thousand Rialls (Iranian currency) went to increase the depth of my well (2 meters) and with the other I became able to establish drip irrigation systems on my tomato farm. All that caused me to put some more hectare of land under tomato cultivation

Another rich farmer believed that the loans were very beneficial:

> I could equip my tomato farm with modern irrigation systems, save some water and put at least 30% more under cultivation. I also was able to level 10 hectare of my dry lands which will be ready to be planted next year.

and,

> By receiving loans I became able to buy some equipments and plumbs, sprinkle irrigation system near my bore hole to provide better condition for wheat lands to earn as much as it costs, no profit, no loss! By increasing the depth of my bore-hole, there will be no problem for years.

According to COR (premise two) these people invested in resources not only to protect themselves against resource loss but also to gain resources. This is not possible for poor farmers and therefore increase (according to premise one) their stress level and vulnerability to resource losses (premise three of COR). The next statement indicates problems for poor farmers inherent in governmental disaster emergency assistance. A rich farmer claimed:

> With traditional irrigation systems, I planted 20 hectare and needed 20 farmhands. Now I plant 35 hectare with the help of 12 farmhands and drip irrigation system. Costs and weeding activities have been cut. By well-ordered irrigation, productivity booms up and I hired fewer workers.

Hence, government interventions, although beneficial (for resource investment, premise two of COR theory) for some parts of the rural population, namely the moderate and rich farmers, have detrimental effects for the poor due to the decrease of job opportunities. That is, rich farmers needed fewer laborers as they had equipped their farms with modern technology (such as sprinkler or drip irrigation systems). Water efficiency also increased, while demands for labor went down; subsequently some workers were fired. As Figure 1 illustrates, government intervention changed the built and financial capital and therefore the future resilience of households, but the effects differ between household groups and are especially negative for the poor, who needed help the most. Another consequence due to increasing unemployment during drought (Paul, 1998) is the increase in labour supply which subsequently decrease wages as well (according to the law of supply and demand).

The moderate farmers' situation lies between those two extremes. Not surprisingly, they lost many things, but not at the same magnitude as the poor, especially as they still had some financial and built capital to cope with the situation (although not on the same scale as the rich farmers). One moderate farmer said:

> I didn't had any yields from my rain feed lands but I can manage it. I could borrow from my friends and I get some loans from the Bank as they are sure I can pay it back.

Another moderate farmer said

> Yes, I lost many things but I had some savings and I used it. Also the government helps me. Although I believed they can do it better. There was some delay but I was able to borrow and will pay it back in the future.

Remittances seemed to play a crucial role, especially for the moderate farmers. One said:

> Drought affected my farming, my shop and many things but it couldn't affect my relatives and family in city. They helped me a lot.

Another coping strategy (typically the evidence of resource loss cycles) is economic adjustments related to asset management (Zamani et al. 2006) and this was also found here, however, only for poor farmers. This included decreases of livelihood assets,

> My refrigerator broke down, but I couldn't repair it or bought a new one. In this hot and humid weather we don't have an essential thing.

or the farmer's personal resources

> I sell the gold of my wife. She is very sad but we had to do it.

as well as activities

> In normal years we have a lot of hobbies, like swimming, camping, fishing, but in droughts we couldn't do them. It upsets me.

Summarizing, built and financial capital are severely affected during droughts and resource investment seems beneficial only for moderate and rich farmers, as they have access to additional help from the government and enough built and financial capital. This, in turn, has long lasting effects on the poor as they have less financial capital in the future due to the decrease in both job opportunities and wages. Furthermore, only in this group are economic adjustments found to be taking place, eventually leading to poverty trap like situations (see Carter et al. 2007; Barrett et al. 2007). The decrease in this form of capital has important consequences on the human and social capital as well.

Human Capital Effects

The majority of poor farmers stated that drought greatly affected their food consumption and resulted in a decrease in educational and health standards. The situation of having no or inadequate food supplies directly affected the health of household members. Since physical activity is the only way they can produce income, an insufficient amount of food reduces their ability to work in the future, exacerbating the negative consequences. Probably most important in the long run is the finding that all of the poor farmers stated that they could not meet the needs of their children's schooling, with two of them expressing that they have been forced to stop their daughters from studying. They also remarked that if they were able to find money to buy clothes or other basic needs, it would go to family members in the following order: father, sons, mother and daughters. Most of the time, nothing is left for the mother and daughters. One said:

> First me, second my sons who work, than the wife and at last daughters.

These findings show that droughts can cause additional negative effects on poor women and that gender discrimination increases during such times. On the other hand, such affects were not observed for moderate and rich farmers. In this regard one moderate farmer said:

> My economic situation has been weaker than past, but I can provide food and educational facilities for my family.

Education seemed to be very important for all groups. Regarding coping strategies one moderate farmer stated:

> We reduced some extra and not necessary cost. But honestly I couldn't see my children leaving school. Maybe we would reduce our food consumption, buy cheap clothes or even sell some things such as my wife's gold but the real gold is my children and their education.

and a rich farmer said:

> We don't have any problem in these issues (food and education)

Education is now seen as an important element for development (Crespo and Lutz 2007; Lutz et al. 2007, 2008) and goes along with increasing standards of health. Due to school dropouts, drought is likely to cause negative development effects for as long as decades, especially for the very poor and within this group especially for women. This decrease in human capital is alarming and should be taken seriously as a development problem. The next focus is on psychological issues.

The first premise of COR theory states that the "acute" loss of resources will lead to stress outcomes, especially for less resilient households. In line with that, farmers believed that the very first effect of droughts is a psychological one due to waiting for rain and constantly searching the sky for a sign of rain or clouds. They reported that when rain doesn't come in time, it results in stress and pressure, and they believed this psychological effect caused health problems. Typical statements of poor farmers were:

> When rainfall is delayed, I feel pressure and stress. Over the night I dream to see clouds or rain but, when I wake up and don't see it, I feel bad. I am sad and this feeling rises up some gastrointestinal disease and blood pressure to me.

Poor farmers also indicated that they lose hope and are very upset during droughts. For relaxation some smoke drugs and cigarettes. One of them said:

> I am very upset and don't have any hope. I lost my self-confidence and I cannot do any things just go close to drug

This behavior could be interpreted as a form of psychological coping strategy (additional to agricultural and economic adjustments) to decrease stress levels.

Summarizing, all the poor farmers said that the situation—encompassing a lack of crop production, debts, school dropout, unsatisfying wages for women and children, emigration, and unemployment—led them to depression and a loss of self confidence. Most of these effects were not found for the medium and rich farmers due to their ability to cope with the event (due to their higher resilience). In other words, using COR theory, there was not an "acute" resource loss situation imminent for them; resource investment, as well as expected gains, protected their current capital stocks and increased their future financial resilience. The very poor, who lacked resources (small resilience or less human and built/financial capital), experienced "acute" resource losses, anticipated limited diversification possibilities (like job opportunities) and had to rely on economic adjustments resulting in negative psychological and health related effects. This seems to support the third premise of COR theory, which states that those who lack resources are more vulnerable to resource losses, which could eventually lead to loss spirals.

Social Capital Effects

One important social capital effect due to drought is youth migration (see for example for Australia the large scale analysis by Edwards et al. 2009). However, this should be considered within the broader context of other household coping strategies (usually migration is not the first choice, see Gilbert and McLeman 2010). In our study, we found that most poor families sent at least two of their children to industrial regions to work during droughts (specifically to the southern Pars, an area with large oil and gas industries). Although youth migration also occurred for moderate farmers, poor farmers sent their children to work the whole year, while moderate farmers sent their children to work only during the school holidays. It was already noted that education is important for all wealth groups and therefore long term migration can be seen as one of the last economic adjustment options chosen by the households. It can also be mentioned that migration can shatter personal (human) resource capital, such as self-esteem and status (Bosch 2003). Rich farmers did not experience migration or school dropouts. Hence, it should be emphasized that migration and dropout rates among the poor are most likely during droughts and have long-lasting effects on their socioeconomic status. Abandoning education results in the family staying in low educational levels and losing potential human (working) capital as those who migrate do not come back to their village. Therefore, poor households cannot increase/improve their human capital resources, and agrarian families will eventually stay in a retrograde cycle, perhaps leading to a breakdown of community structures. Drought also causes loss of trust among farmers, or in other words, reduces social capital (support networks, social participation, community engagement, social cohesion, see Figure 1). Poor farmers believe that during a drought they are in a weak position and exploited by rich farmers. One of the poor farmers said:

> They (rich farmers) borrow money, we use the document as a guarantee hold and eventually the owner will be them.

and another adds,

> Drought is an opportunity to take our lands out of our hands.

A poor farmer said:

> Rich farmers pay our wives and kids low wages, instead of helping us. And if there is a nag, they dismiss us and hire another one quickly.

From the other (rich farmers) point of view, it is believed that drought worsens the situation of the poor, who therefore try to rob the assets of the rich. A rich farmer stated:

> Robbing is booming up. Thieves are mostly the kids of whom their farms suffered from drought badly.

Also the (unintended) uneven distribution of government aid causes tensions. A poor farmer stated:

> I myself had not received any kind of loans, so governmental exemptions did not have anything to do with me. Everything went to the rich.

Taking loans seemed useless to others as they thought that only the rich were able to take loans, as they had an extended network of relationships.

> The rich have money, friends, relations and they bribe to receive loans and take financial aid out of turn. If I wanted to get a financial aid, I would be told to bring bailsmen or documents for deposit. Well… I do not have any.

Related to this topic a poor farmer reported:

> Mr.… had a huge amount of money as a loan for drip irrigation systems. He equipped his farm in a new way and bought some pieces of my brother's dry land next to him.

Such perceptions can lead to social disruption and disloyalty in rural areas. The poor see themselves as isolated and being discriminated against by the government.

As was already indicated, poor farmers use different activities to survive during an extreme situation. Some of these include illegal activities such as robbing or smuggling

drugs, guns, and alcohol, causing additional social problems, such as distrust between different social groups. In the response to our question: “who is doing all these things? And who is responsible for burgling?” a majority of the moderate and rich accused the poor and landless rustics.

> Who can do all these bad things? Just poor and beggars! They destroy social safety. They don’t let us have peace. We want security to farm.

On the one hand, the poor farmers feel disloyalty towards the rich ones and accuse them of favoritism and exploitation whereas the rich farmers consider their poor neighbors as addicts, thieves, smugglers and vandals. They also don’t trust them and use other methods to cope with this situation.

> We hire Afghan workers and make them guard during nights. Afghan’s payment is lower than Iranian.

This situation (the poor against the rich) eventually puts the community in a retrograde cycle of sustainability. Social capital decreases and therefore the resilience of all households drop as well. However, the poor will be affected the most, as all other forms of capital are decreasing too. Taking credits is sometimes one of the last options for the poor but can have serious consequences in the long run. One farmer said:

> Many farmers are indebted. When drought happened they cannot pay back money to creditors. Therefore conflicts and quarrel rise up.

Another adds:

> In a drought period local creditors easily confiscate our land and property and it is a reason for conflict.

Furthermore, all the poor and moderate farmers mentioned that in the past, they could participate in feasts, religious ceremonies, and help relatives or friends when they were in need. It has been assumed such activities left them brimming with confidence. But as social interactions are reduced, farmers cannot do any of these things, so they turn to solitude and they are instead burdened with depression. In this regard one poor farmer said:

> In normal years I could present some things (money or gifts) for religious and cultural ceremonies. But in a drought period I couldn’t. So I shy and

> don't like to participate in these social events. It made me sad and unhappy.

Social support seeking is an important strategy (within the COR theory) to mitigate the effects of drought. However, such coping strategies, which could play an important role in conserving human capital (personal resources), are no longer available. This increases drug consumption (as a psychological adjustment) causing additional problems within the dimension of social capital.

Summarizing, effects and interrelationships between the built/financial, human and social, capital during droughts—(unintentionally) exacerbated due to government intervention—were discussed. Resilience increased (for both short and long terms) for some subparts of the farmers' population, mainly the moderate and rich farmers, and decreased for those who need the help the most, i.e., the poor farmers. Ending this section, Table 2 summarizes our results from the qualitative study and shows the capital effects of drought on the three different wealth classes of farmers, as well as severity of the effects—severe, moderate, minimal, and none found).

It should be noted that the increase in productive/built capital will also have consequences on other capital dimensions in the future, such as an increase in economic and financial capital as well as education and community engagement. The same is also true on the negative side. Built capital resources are often used in developing countries as kind of insurance in case of economic stress situations, which is especially problematic if resources are low (Delacote 2009), eventually leading to poverty trap like situations (see Carter and Barrett 2006) that are even more likely if other kind of stresses (and reduced resilience resources) are exacerbating the already negative situation.

Discussion

Drought is a natural and recurrent phenomenon in Iran and causes different effects on different wealth groups of farmers. These effects are very complex and cannot easily be separated from each other, as they are interrelated and can impact farmers in many ways. As it was shown, the related economic, social, psychological and health consequences can differ widely among farmers. Furthermore, government ex-post interventions can have unintended negative side effects for sub-groups of the rural population. The poorer farmers especially are less resilient as they have only limited resources from various forms of capitals—e.g., no savings, no possibilities to take out (cheap) loans, few livelihood assets (all of which are parts of built/financial capital), no reliable job opportunities, negative health effects due to stress, increased school dropout rates (all of which are parts of human capital), and no social networks to be supported during a drought (all of which are parts of social capital).

Table 2. Summary of Drought Effects Differentiated Into Different Wealth Classes.

		Poor Farmers	Moderate Farmers	Rich Farmers
Social Capital	Community engagement	Severe	Moderate	Moderate
	Participation	Severe	Moderate	Moderate
	Cohesion	Severe	Severe	Severe
Human Capital	Quality of life	Severe	Minimal	No effect
	Happiness	Severe	Minimal	Minimal
	Depression	Severe	Minimal	No effect
	Self-confidence	Severe	Minimal	No effect
	Well-being	Severe	Minimal	Moderate
	Education	Dropouts	Can't afford to buy everything needed for school	No effect
	Health	Severe (blood pressure, heart disease)	Influence	Moderate
	Migration	Yes	Yes (partly)	No
	Unemployment	Severe	Minimal	No effect
Built/ Financial Capital	Economic	Losses below subsistence level	Losses large, but not below subsistence	Loss in Profits
	Financial	Not adequate	Adequate	Adequate
	Built	Decrease	Small increase	Increase

We explained the effects of droughts on the individual level via the Conservation of Resources theory, which explained the different coping strategies used by the different households via the premise of resource investment. From a time-dependent perspective, in the very beginning (first phase) of a drought (i.e., when it does not rain in time) the farmers are faced with psychological effects (due to stress), eventually leading to illnesses, such as blood pressure, heart disease, gastrointestinal disease and digestive system disease, headache, inaction and narcosis. In a later stage (second phase), during and shortly after the drought, financial, economic and social effects begin to emerge. For poor farmers, two effects simultaneously materialize. First, as they are subsistence farmers, reduction in crop yields directly affect their consumption patterns and productivity. Second, additional income sources (mostly job opportunities for wealthier farmers) decrease or are less well paid, due to an increase in the labor force. Hence, poor farmers frequently have to use illegal income sources, resulting in an increase of conflicts between rich and poor farmers, and a decrease in social capital. The need for nutrition puts pressure on poor farmers to take children out of school (reduction of happiness not only for children, but also for parents, as well as an increase in stress levels), which leads to a decrease of human capital within the family. This can have long-term consequences, especially for women due to gender discrimination, as human capital is now seen as an important driver for development (Crespo and Lutz 2007; Lutz et al. 2007, 2008). Also,

migration of young family members to work abroad reduces the family workforce and can cause some negative psychological effects. In the third phase, conflicts among farmers reduce social capital (including trust) in rural areas, further exacerbated by government intervention, which has diametrically opposite effects for rich and poor farmers. Furthermore, sales of assets and land, as well as increasing debt, add to farmers' stress level and reduce their self-confidence and happiness. That puts the farmer, and eventually society, in a progressive low-cycle stage, or even into a poverty trap like situation. If such situations cannot be prevented, they could result in mass migrations from rural to urban areas and an increasing dependency on food imports (Foltz 2002; Balali et al. 2009). While these very extreme negative effects are most notable for the poor, the moderate farmers are also severely affected. However, it seems that they are resilient enough—via the use of savings, job diversification, government help, or selling some of their non productive assets—to limit the negative effects to the short run. However, such coping strategies will likely fail in the case of recurrent severe droughts and may cause the same effects as observed for the poor farmers.

As it was shown, government interventions could cause additional problems via the false assumption that all farmers are in the same socio-economic condition. It was found that the rich and moderate farmers are able to utilize government assistance, and these programs result in unintended negative side effects for the very poor farmers over time. That is, higher productivity results in fewer job opportunities for poor farmers after the drought. Specifically, because of the assumption of homogeneity of farmers, the government treats the drought as a crisis and therefore uses crisis management for solving the problem (for more detail sees Wilhite 2002). Crisis management focuses on relief, and within the relief process it was found that this strategy results in unintended negative side effects, including a decrease in social capital, an increase in poverty and increase in conflicts eventually leading to an unstable situation within the society.

One alternative to avoid such problems would be the shift from relief or ex-post interventions to "proactive" risk management (Lindell and Perry 2004), like in the case of Australia (for an extensive discussion see Botterill and Wilhite 2005). Here, all aspects of society, sub-groups and individuals are incorporated in a systematic manner. It seems that early warning systems and preparedness strategies are key elements. Undoubtedly, in the Iranian situation where drought happens frequently, risk management could be a suitable alternative. The government, as a key actor in this process, should increase its efforts to target the very poor, not only in the immediate aftermath or emergency phase of the event, but also in the disaster recovery phase (Lindell and Perry 2004) by focusing on decreasing the likelihood of possible negative long term effects such as dropouts and gender discrimination.

From a modeling perspective, the analysis showed (see also Nelson et al. 2010) that adequate sustainable development modelling approaches need to incorporate interdependencies among different population groups at various spatial scales—from the

individual to the national level—as well as the economic, human and social dimensions of capital. Furthermore, the different factors can be closely linked and thus interdependencies need to be explicitly incorporated. Otherwise, government intervention could result in a biased output, eventually leading to the wrong crisis or risk management strategies—at least for some sub-groups. It should be noted that empirical information on interrelated effects (flow effects) over different sub-groups are difficult to gather within quantitative based approaches and in this case, qualitative approaches may be the superior method.

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Disaster Policy Change in Indonesia 1930-2010: From Government to Governance?

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Scientific study on what actually drives disaster policy reform in the developing world is extremely limited. As pioneering research for Indonesia, this paper questions what are the forms of disaster risk governance in Indonesia through time and what are the main reasons for such changes over time. Disaster reduction policy reform in Indonesia today takes place amid global disaster risk governance initiatives under the auspicious Hyogo Framework for Action. The author observes that changes in disaster reduction policy in Indonesia over the last 80 years have been less attributed to domestic responses to the large scale natural catastrophes than to co-production of and interaction of local and disaster reduction actors and institutions. The paper highlights how new forms of risk governance have emerged from government as a dominant actor during the 20th century to more polycentric governance in first decade of the 21st century in Indonesia.

Keywords: Disaster risk reduction, policy change, disaster risk governance, government, Indonesia, disaster policy reform.

Introduction

Indonesia is the largest archipelagic state in the world, with at least 17,000 islands, of which more than 7,500 have already been named and about 6,000 are inhabited (Ministry of Home Affairs 2009).[1] Its unique position on the Pacific Ring of Fire leads to high exposure to recurrent natural hazards, such as earthquakes, tsunamis, and volcanic eruptions. Indeed, about 10% of the world's volcanoes are situated in Indonesia.

Indonesia has a total population of 234 million (BPS 2009) and nearly half of these inhabitants are now living in coastal cities, which have high exposure to coastal hazards such as tsunamis and floods, including coastal floods and storm surges.

The increased disaster risks triggered by both geological and hydro-meteorological hazards, coupled with anthropogenic drivers throughout the Indonesian archipelago during the last 50 years, have caused a total monetary loss at about US$24 billion, and at least 95% of the total loss occurred in 1996-2009. The highest losses were due to the 1997 forest fire and drought, for which direct economic losses reported almost doubled those of the Indian Ocean tsunami in 2004 in Aceh (Lassa 2011). The year 2007 marked the start of Indonesian disaster policy reform era because there were dramatic shifts in the form of regulation, benchmarked by the new disaster management law (Law 24/2007). The government started to set a clearer vision of disaster risk management as it claimed to depart from reactive response to be more proactive in reducing risks *ex ante* disaster emergency events (Pujiono 2005).

This paper asks two interrelated questions: First, what has driven changes in disaster reduction policy since the end of colonial period? Or, what are the main reasons behind disaster risk reduction (DRR) policy change in Indonesia during the last 80 years? Second, what forms of disaster governance have taken place over time?

"Disaster risk governance" or "disaster governance" are used interchangeably in the following discussion. The definition of the terms is provided in the next section (Section 2). Section 3 provides the research methods. Section 4 discusses the forms and the phases of disaster governance in Indonesia during 1930-2010. Section 5 discusses the findings. Section 6 reflects and concludes and asks new research questions.

Defining Disaster Risk Governance Framework

Combining *disaster risk* and *governance* together as a concept is a rather new academic exercise (Lassa 2010a). Governance refers to steering privileges that are no longer the monopoly of (the still relevant) "governmental agencies, but [are] de facto (and in many cases also de jure) the common responsibility of a variety of agencies, representing governmental bodies, market agencies, and civil society organizations" (Arts and Leroy 2006:13). Governance is about being mindful of a multifaceted, multi-level, multi-stakeholder approach and cross-scale dynamics (Cash et al. 2006).

Renate Mayntz argues that governance theory began by "being concerned with the steering actions of political authorities as they deliberately attempt to shape socio-economic structures and processes." However, recently, "governance" has been used in ways that differ from political steering. First, it is used as an alternative mode of governing that is distinct from the hierarchical control model, namely, "a more cooperative mode where state and non-state actors participate in mixed public/private networks." Second, it is used to mean different models of coordinating individual actions

or basic forms of social order (Mayntz 2003:27). Mayntz (2003) further claims that modern governance after World War II arose from the growing aspiration of governments to steer their nations towards better defined goals of social and economic development. The first phases of this development are as follows: First, in the late 1960s, the trend began with a boom of theory of planning for (and how to steer) economic development. Second, in the 1970s, as the planning euphoria declined, empirical analysis became preferable for policy development; this directed attention to contextual factors influencing policy development, in particular executive government organization. Different policy instruments were discussed, in particular the rule of law. Finally, in the second half of the 1970s, policy implementation became a new research focus. As Mayntz (2003:29) noted, "the first paradigm of governance concept was thus concerned with policy development and policy implementation and it adopted a top-down or legislators' perspective."

Adopted from McGinnis (1999), Lassa (2010a) defines disaster risk governance (DRG) as the way society as a whole manages its full array of disaster risks that may be triggered by geological hazards such as earthquakes; climate change and hydro-meteorological hazards (such as floods and cyclones); conflict and war in order to sustain development, human welfare, and dignity. It promotes the notion that there are many overlapping arenas (or centers) of authority for decision making and responsibility for disaster risk reduction. DRG acknowledges new alternative forms of policy and regulation that are distinct from traditional hierarchical government activity and implies an alternative form of governance that is more inclusive to diverse actors and diverse knowledge. It does not mean that government no longer has a role because, in fact, governments are expected to steer the conditions of inclusive governance. In other words, any form of governance of disaster reduction may be subject to government "approval".

It calls for consideration of balancing both contextual formal institutions (laws, regulations, policy) and informal institutions (norms, culture, customs) and the inclusion of agencies and actors (local-national-global with consideration of gender, age, and class), as well as different perceptions and types of knowledge of disaster risk reduction. At operational levels, from the global level to the national level down to the village level, there is a range of actors involved in reducing risk—state actors (executive and legislative agencies), United Nations agencies, Red Cross, local and international non-governmental organizations (INGOs), grassroots organizations, professional associations, and private businesses (Lassa 2011).

The established concept "disaster risk management" (DRM) is embedded in the disaster risk governance concept. In comparison to DRM, the DRG concept offers a greater emphasis on the decision-making process regarding disaster reduction policy and regulations with greater acknowledgement of the complexity, conflicts, and interests of actors, multi-dimensionality and interplay of various institutions and actors at multiple levels as well as the polycentric nature of decision making regarding disaster risk

reduction. DRG, in other words, provides the institutional and governance framework within which DRM is to be implemented (Lassa 2011).

Research Methods

To answer the research questions, the author uses mixed methods such as literature reviews, participant observation, and unstructured interviews of key actors at the national level, and literature reviews (DRM policy documents produced during 1930-2010). The literature reviews and ethnographic research guide the author to investigate the history of disaster management policy during the past 80 years. It is widely accepted by social science researchers that documents are sources of data for many different types of analysis such as discourse analysis, content analysis (Briman 2004), or policy change analysis (Marston 2004). The documents can be personal documents, official documents from government and/or non-governmental organizations, private organizations, mass media, and the internet (Briman 2004), and can be in the form of manuals and guidelines. What are defined as "documents as sources of data" are the materials that can be read, have not been produced specifically for the purpose of social research, and are preserved so that they become available and are relevant to the concerns of the social researcher (Briman 2004:381).

Participant observation and unstructured interviews were used at the targeted "communities" that were mainly disaster management professional and policy communities. The author employed participant observation and unstructured interviews to collect information from relevant disaster management stakeholders such as Indonesian Disaster Management Society and National Disaster Management Office. This research benefited much from the author's existing links and networks in Indonesia, such as the Indonesian Disaster Management Society and DRR-related civil society organizations, which were advantageous, especially during data collection.

Indonesia Disaster Management Institutional Change: From 1930-2010

Indonesia has been experiencing different government and political regimes. The first was the Dutch colonial government regimes that formally ended in 1949. De facto, the Dutch colonial government had exercised no power during the Japanese occupation from 1942-1945. The Sukarno regime, which was the first authoritarian regime that ruled the country (1945-1966), was replaced by the "New Order", the era of Suharto's authoritarian rule that started in 1968 and collapsed in 1998 at the hands of mass reformists. Since 1999, reformation regimes have governed under three presidents—Burhanudin Yusuf Habibi (1998-1999), Abdulrahman Wahid (1999-2001) and Megawati Sukarnoputri (2001-2004). Since 2004, Indonesia has been ruled under the post-reformation regime of Susilo Bambang Yudhoyono (that is expected to rule till 2014).

Indonesia rejects federalism because of its unitary state ideology rooted in the 1945 Constitution. In contrast to the United States' decentralized system that delegates powers to the state-government level (equivalent to provinces in Indonesia), Indonesia has taken a different path since 1999 by decentralizing central government power directly to cities/districts and not at the provincial level, except for the special case of Aceh province. More than 220 new cities/districts (municipalities/regencies) have been created since 1999. In 1998, the total number of cities/districts was 280 and in 2010 it was 500 (Lassa 2011). Indonesia's decentralization is characterized by multiple hierarchies of structure, function, funding, and areas of responsibility. There are "missing links" in vertical governance (Sudarmo and Sudjana 2009) that affect the steering power of central and provincial governments to enforce national policy at the city/district level. This paper limits its scope to only discuss macro level changes at the national levels.

In contrast to the United States, Indonesian politics do not have real opposition power that may challenge any ruling regime to change policy direction. It may sound like an exaggeration to expect Indonesian legislators to play a critical role in the ruling government because the practice of political opposition is not yet fully developed, even though it is possible by law. In the words of experts, opposition practice in Indonesia "remains structurally weak and divided." (Aspinall 2000)

This introduction guides the readers to understand the phases of disaster risk management policy and different forms of disaster governance practice in Indonesia which is divided into six different eras (Table 1). The first era is the colonial emergency policy created at the end of the 1930s. The second era is demarcated from independence in 1945 until the early 1960s. The 1960s-1990 can be considered as the third period. The fourth era started in 1990, at the beginning of the formal period of International Decade for Natural Disaster Reduction (IDNDR). At the end of the IDNDR era, Indonesia entered its fifth phase of DRM policy during 2000-2007.

Disaster Management Institutions in Colonial Period

The colonial emergency management policy was also known as Regeling op de *Staat van Oorlog en van Beleg* (shorten as SOB) endorsed in 1939 (Hariyono 2008). It was an important piece of legislation that determined disaster management and emergency policy in Indonesia for the next 20 years after independence in 1945 and its influence can be tracked during the New Order period. The SOB 1939 regulated states of emergency that might arise from acts of external agents (mainly external siege by foreign forces at the beginning of World War II). SOB 1939 distinguished between two different situations: the Staat van Oorlog (SvO) declared an ordinary war situation and the Staat van Beleg was activated under extraordinary conditions of a war emergency[2].

For both conditions, the general governor had no obligation to seek permission from *volksraad* or legislative body in times of emergency (see fuller discussion in Hariyono

2008:24-34). The links between emergency and mitigation policy in the Netherlands and its colony of the Netherlands East Indies (i.e., Indonesia) will not be discussed; however, study of such links is well recommended for further scientific investigation.

Table 1. Phases of Disaster Risk Management Policy and Regulation in Indonesia

Phases	Name of Law/Regulation	Remarks
Colonial Emergency Policy 1930s – 1945	Regeling op de Staat van Oorlog en van Beleg a.k.a. SOB 1939**.** This was later formally cancelled 12 years after independence through Law 74/1957	This regulated war emergencies and extraordinary emergency wars. Officially, it co-existed with Emergency Law 6/1946 for 11 years till 1957.
1945-1960	Law 6/1946 on Emergency Situation (or Bahaya), The amendment of Emergency Situation Law 1/1948, and Law 30/1948 on Transfer of Full Sovereignty to the President during Danger Situation	Regulated emergency situation due to war and natural disasters – the original law 6/1946 acknowledged civil society actors as an alternative power to deal with emergency.
1960-1990	Keppres* 54/1961; 312/1965 regarding Central Committee for Natural Disaster Shelter; Keppress* 256/1966 and Cabinet Presidium Decision 14/U/Kep/1/1967 on Coordinating Team for Natural Disaster Management Implementation; Advisory Agency on Natural Disaster Management Keppres 256/1966; Keppres 28/1979 - National Coordinating Agency for DM	Ad hoc emergency response committees for natural disasters – government-centric. Three revisions of DM regulation during 1965-1967 due to large-scale and nation-wide impact of El Nino-driven drought as well as the eruption of a volcano
1990-2000	Keppres 43/1990 - National Coordinating Council for Disaster Management; Keppres 106/1999 - National Coordinating Council for Disaster Management	A shift to re-acknowledge manmade disasters. It suggested considering both natural and manmade disasters. This coincided with the IDNDR period.
2001-2007	Perpres** 3/2007 on Amendment of Perpres** 83/2005 National Coordinating Council for Disaster Management; Perpres 83/2005 **-** National Coordinating Council for Disaster Management; Keppres 111/2001 Amendment of Keppres 111/2001; Keppres 3/2001 - National Coordinating Council for Disaster Management and Internally Displaced People	2001 amendments of Presidential Decree were made to accommodate the need for aid distribution to internally displaced people during 1998-2002. The 2007 amendments were related to catastrophic events such as the Indian Ocean tsunami in 2004 and the devastating earthquake in Yogyakarta in 2006.
2007 onwards	Disaster Management Law 24/2007 enforced at national level through Presidential Regulation 08/2008 regarding NDMA; PP*** 23/2008 regarding Roles of International Agency and INGOs in DM; PP*** 22/2008 on Budgeting and Management of Disaster Aid and PP 21-2008 DM Implementation/Operational	Long deliberative processes since 2005 with hundreds of meetings/public debates/hearings/consultations. Drafts provided by many different sources, with local and international support behind the scenes. See section 6.5 for more detail explanation.

Source: Author; *Keppres = President's Decree; **Perpres = Presidential Regulation; ***PP = Government Regulation.

In terms of investment in science, the colonial government was far more advanced in comparison with the later nw government of Indonesia, especially during the period from 1945 to the 1960s. It was not simply the lack of human resources but also the radical change in the organizational and institutional "template" (e.g. leadership, bureaucracy's

epistemic culture (Knorr-Cetina 1999)[3], national institutions, etc.) that set back the young state for quite some time.

Another obvious reason for the discontinuity of institutions dealing with geo-risks is the multiple displacements of the Geological Agency (including its Volcanological Survey) over a period of more than 30 years. The Geological Agency during 1945-1946 was under the management of the Ministry of Public Works. During 1946-1947, it went under the management of the Wealth Minister. During 1949-1950, it went under the remit of the Wealth and Industrial Ministry. During 1952-1957, it went under the remit of the Ministry of Economy. During 1957-1959, it went under the remit of the Industrial Ministry and, in 1966-1974, it went under the remit of the Department of Ministry of Trade and Mining. It enjoyed stability during 1974-1992 as it was administered only by the Ministry of Mining. In 1992, the government changed this institution from the Ministry of Mining to the Ministry of Energy and Mineral Resources.

The Krakatau eruption in 1883 was probably one of the largest emergency relief operations in the Dutch colonial government period. It would be incorrect to say that the Netherlands East Indies government disregarded the importance of dealing with natural disasters given the absence of specific notes in the SOB 1939 to cover natural disasters. In fact, the opposite might be the case in that the colonial government learned from the Krakatau eruption on 27 August 1883. One month after a catastrophic eruption and tsunami, while people were still dealing with emergency operations such as burying the dead and clearing wastes and ruins, rebellion actually took place in Serang, Banten Province. Such a rebellion reemerged at greater intensity five years later. Winchester (2003) asked the question of whether social change after the Krakatau disaster (e.g. the fading of the influence of the colonial government, the loss of its self-confidence after the Krakatau disaster, and the rise of the Banten peasants' revolt backed up by Islamic teachers and *hajjis*) in Banten, which later propagated the spirit of anti-colonialism elsewhere, might have triggered movement in the rest of Java (see Winchester 2003:334-445). The teachers and *hajjis* applied religious explanations about divine punishment to the colonial government as well as the Banten people who served this 'non-believing' government. Kartodirdjo (1966) stated that the revolts were due to the misery directly caused by exploitation through the colonial system and later severely amplified by the Krakatau tsunami in 1883 that swept through Banten's coastal communities.

Indonesian Disaster Management Policy 1946-1960s

In fact, in the United States during the 1960s, government-supported disaster sociologists tried to understand people's behavior during disasters, which was to enable the government to understand how people would react to nuclear attack as well as natural hazards and technological disasters (Tierney 2007, p.504). The context of 1960s' disaster

policy is often known as the pattern of war approach and military orientation of disaster inquiry during the Cold War period (Gilbert 2005).

One year after independence in 1946, the young state started to regulate emergency management by taking natural disasters into account in addition to manmade emergencies through National Law 6/1946. There are important lessons from Law No 6/1946. Firstly, surprisingly, from early on and just before the nation experienced its first authoritarian regime, in the so-called Old Order period, the government acknowledged the power of civil society actors, especially the prominent Islamic organizations, as civil stakeholders to deal with emergencies. Furthermore, as another interpretation to the law, it accepted a great deal of influence of civil bureaucrats and early civil society organizations in the drafting of the law by bringing in other actors to tackle potential *bahaya* (a direct translation is *danger* but can mean *emergency)* and there were demands not to hand all power to the military in emergencies (including those caused by natural disasters; see Hariyono 2008, p.39).

Law 6/1946 marked government attention to considering natural disasters as the fourth external agent that might be a threat to the young nation (along with external attacks by foreign military, potential attacks by a latent enemy, and riots that might take place beyond the civilian government's capacity to control). The law placed the authority of emergency management at the National Defense Council, which comprised the prime minister[4] and relevant ministries, three civil society organization representatives (mainly faith-based), and the military commander. It stated that the president could declare a dangerous situation to the nation that may arise from natural disasters (Article 1-d, UU 6/1946 about dangerous situations). However, Law No. 6/1946 was short-lived and soon became redundant, an example of 'institutional mortality', a term coined here to explain either abandoned laws produced by the government (hence, wasted investment) or the absence of law enforcement at all levels. When the first regime under President Sukarno became authoritarian, the law was amended by Law 1/1948 and later Law 30/1948 regarding the transfer of full sovereignty to the president during states of national emergency.

This can be considered the second form of disaster governance in Indonesia, when the design of emergency laws was driven by post-Second World War logic, and when emergency management heavily focused on attacks from either foreign powers and/or civil war. There was very little paradigm shift towards the need for natural hazard management (pre and post disasters) because, during this period, apart from a large-scale eruption of Kelud volcano in East Java in 1951, which only attracted scientists, there were no significant "focusing events" (Birkland 1996) that triggered a policy and political response towards the management of natural hazards.

During the period of 1945-1959, the focus of the national governments was fully on building a nation state and most priorities were focused on the details of various sectoral

legislation developments and legislation products related to the formation of new administrative units throughout Indonesia (Lassa 2011).

In the mid-1950s, the government produced the Five Year Development Plan 1956-1960 document, one of the earliest development policy documents that revealed early recognition of disaster risk within a development context (Republic of Indonesia 1958) There are at least two important written messages: an awareness regarding the roles of forest ecosystem services to mitigate disaster risk (Republic of Indonesia 1958, p. 27)[5] and post-disaster policy mandated to the social service sector to provide assistance for people affected by natural disasters, conflicts, wildfire hazards, displaced persons, and the victims of attacks by dangerous animals and beasts (Republic of Indonesia 1958, p. 143).

Changes occurred in the 1960s when some regulatory tools related to disaster response were produced. At least five organizations related to disaster response were produced during this period, such as the Central Committee for Natural Disaster Shelter[6], the Advisory Agency on Natural Disaster Management[7], and the Coordinating Team for Natural Disaster Management Implementation.[8] All these agencies were *ad hoc* in nature. However, in practice, things stayed the same because these agencies were merely reactive to disaster events; there is barely evidence that they comprised an *ad hoc* structure that could act prior to events (see also Department Sosial 1976).

Indonesian Disaster Management Policy 1960s-1990

During the 1960s there were some natural hazards with catastrophic effects, such as the Mount Agung eruption in Bali, which killed about 1,600 people in February 1963; the El Nino drought-related events, which resulted in about 8,000 deaths in 1966; and the Mount Kelud eruption, which resulted in the deaths of about 200 people also in 1966[9], which was far less intense than the eruption in 1856 when lahars[10] were emitted that killed 10,000 people. The different numbers of deaths are not because of better policy or better capacity in volcano preparedness in 1966, but simply different scales and characters of the eruptions; clearly, the magnitude and characteristics of hazards play roles in shaping the risks (Alexander 1993).

There was a paradigm shift from war/conflict to "natural" disasters during the 1960s, which can be considered an achievement of institutional change, the main cause of which was probably an increase in the number of natural hazard events that drew attention from the government. However, in terms of manmade disasters, this was probably the worst period in the nation's history. The second half of the 1960s was a bad time in Indonesian politics. With the fall of the Old Order regime under Sukarno's presidency and the coming of the New Order regime under General Suharto, Indonesia experienced a high level of political instability during 1965-1970. During 1965-1966, many political scientists have asserted that political conflict caused a total of about 500,000 deaths

(McGregor 2009) especially among those associated with the Indonesian Communist Party. Such a catastrophic number is obviously greater than the result of any single natural hazard that has occurred in Indonesia, and even worse than the combination of all the total losses of life triggered by natural hazards during the past 50 years in the country.

It is understandable that knowledge of disaster risk management during the 1960s was lacking as elsewhere in the world and more lacking in the developing world. Few scientific conferences took place during this period, but some international reports regarding geological expeditions in Indonesia during the 1960s are available. For instance, a volcanological mission from UNESCO studied volcano-associated risks in Indonesia (Tazieff, Marinelli, and Gorshkov 1966). At the national level, knowledge accumulation was achieved at a very low rate and one of the problems was that the government of the 1960s was not able to capitalize on all the knowledge produced by technical agencies such as the Geological Agency (established in the 1850s, which later created its volcanological research division (*Volcanologisch Onderzoek*), in 1922 as well as the meteorological office, established in 1866). The Geological Agency emerged from the "Volcanological Survey of the Netherlands East Indies"(See www.bgl.esdm.go.id). In addition, these kinds of technical organization suffered the discontinuity of support from the Dutch Government, which occurred at the end of 1949 after the handover from the Dutch government following the decision to grant full independence.

Natural events such as volcanic eruptions during the 1970s did not appear to be on the same scale (in terms of impacts such as loss of life and damage) as those in the 1960s. However, it was mainly that all large-scale natural hazards in the 1970s happened on remote islands or away from Java; the major event that was closest to the country's administrative and population centers was in Bali, while others happened on Flores and in the West Papua region[11]. In the Flores region in 1973, there was a cyclone that killed about 1,600 people according to EMDAT 2006 (www.emdat.be). In 1976, there were modest earthquakes in Bali and West Papua, which caused over 1,000 casualties. In July, 1979, there was a large-scale event of a landslide-triggered tsunami on Lembata Island, Eastern Flores, which killed more than 500 people (Jeffery 1981). Five months before that, less than 100 kilometers away from Lembata in the Eastern Flores district, at least 500 people died due to flash floods and *lahars* swept away 50% of Larantuka Town situated beneath the dormant Ile Mandiri volcano mount (Lassa 2009).

Given the history of ASEAN (Association of Southeast Asian Nations) Cooperation on Disaster Management, disaster policymaking in Indonesia during the 1970s was not completely isolated from regional and international processes. In 1971, disaster management experts in the ASEAN region formed the ASEAN Expert Group on Disaster Management (AEGDM) and met every two years. In five years, the issue of regional cooperation in the field of disaster management was adopted as one of several ASEAN objectives and principles stipulated in the Declaration of ASEAN Concord I. This was

further manifested as the ASEAN Declaration on Mutual Assistance on Natural Disasters in June, 1976[12].

The Declaration of ASEAN Concord (Bali Concord I), adopted on 24 February, 1976, further stressed the need for cooperation in disaster management within ASEAN. One of its eight principles was: "natural disasters and other major calamities can retard the pace of development of member states; therefore, they shall extend, within their capabilities, assistance for relief of member states in distress." The agreement was known as ASEAN Declaration on Mutual Assistance on Natural Disasters – signed in Manila on 26 June, 1976. Looking at the driver behind these initiatives, it was partly in the United States' interest to fund such kinds of declaration as soft mechanisms to control the influence of communism in the region in this Cold War period (Buszynski 1992).

Indonesia's approach to the structure of disaster risk management shared a similar history to that of other Southeast Asian countries such as the Philippines. In the Philippines, following the earthquake of 1968, the Civil Defense Administration was pushed to create an *ad hoc* structure called the "National Committee on Disaster Operation" (based on the Administrative Order No. 151, 1968). This was later changed following the Sening typhoon that devastated the Bicol Region and inundated metropolitan Manila for almost three months, which placed great pressure on the government to create a National Disaster Control Center. The Civil Defense Administration era was superseded by the new Office of Civil Defense, which was to ensure protection of people during calamities. However, in 1978, a presidential decree (No. 1566) provided a new milestone for the establishment of a structure of disaster management, namely, the National Disaster Coordination Council (NDCC) including regional and local structures. The NDCC under the presidential decree lasted for 32 years until the country changed its institutional structure (namely, the National Disaster Risk Reduction and Management Council) through the new Disaster Risk Reduction and Management Act in February, 2010 (see http://ndcc.gov.ph/home/index.php).

Returning to Indonesia in July, 1976, one of the first recorded national multidisciplinary workshops on disaster risk management was held in Jakarta, and was attended by stakeholders such as the National Development Planning Ministry, the Health Department, the Finance Minister, the Office of Meteorology and Geophysics, the Geological Survey, the Indonesian Red Cross, and international players such as the United Nations Development Program and USAID—one of the main sponsors of the ASEAN agreement. Only one multilateral agency, the United Nations Development Programme (UNDP), presented a paper related to "pre-disaster planning and relief instruction" and some national organizations started to argue about the need for disaster mitigation (Departement Sosial 1978:14)

Table 1 suggests a shift of institutional focus from manmade disasters (such as war/conflict) to natural hazards in the earlier period in the 1960s lasted till 1990. This can be interpreted as a dramatic change of focus towards natural hazards, especially when a

presidential decree was finally issued in 1979. The 1979 disaster management regulation placed emphasis on natural disasters. Disaster risk management activities during this period were reactive emergency response and recovery as indicated by the decree. The structure was often activated after disasters (Pujiono 2005). The organizational format of the "National Coordination Agency" lasted for almost 30 years (with different names from time to time—"National Coordination Agency", "natural disaster management", "disaster management", or "disaster management and internally displaced people"), but it was succeeded by the new format of the National Disaster Management Office in 2008 as stipulated in Disaster Management Law 24/2007, three years after the Hyogo Declaration.

The national disaster management institutions were partially dormant because of either a lack of natural disaster events during the 1970s or the remoteness of the events from Jakarta that did occur. There was no significant institutional change from the second half of the 1960s until the end of the 1970s, when, in 1979, the government suddenly produced a presidential decree regarding the National Coordinating Body on Natural Disaster Management (a.k.a. Keppres 28/1979).

From ignorance of the need to manage natural hazards before the 1960s, the government was now committed to more serious actions. This was an indirect product of a discursive change on the need to have a fixed structure to manage natural disasters, which had some roots in the ASEAN regional workshops on disaster management during the 1970s. The details of how this change happened are subject to further academic investigation, but the organizational change only happened at the surface with a shift from *ad hoc* committees to a coordinating body that could organize all disaster cycles (in accordance with Cuny and Abrams's cycles of prevention, mitigation, preparedness, emergency, rehabilitation, and reconstruction—Cuny and Abrams 1983). Presidential Decree 28/1979 had the noble objective of taking natural hazard management more seriously than the Old Order regime by recognizing the need for systematic emergency management triggered by natural events. The departure from war/conflict towards a post-natural disaster focus was not by chance. Nevertheless, enough evidence suggests that national-international interaction since the early 1970s had managed to place this agenda on the table of the government.

Indonesian Disaster Management Policy in 1990s

In the 1990, at the same time as the start of the IDNDR, the government corrected the 1979 decree arguing that a focus on only natural disasters, with a purely humanitarian emergency and post-disaster response-oriented policy, was not enough. It suggested reconsideration of non-natural hazards and, for the first time, formal recognition of the need to work in accordance with disaster management cycles, the famous before-during-after disaster management. In Presidential Decree 43/1990 on "National Coordinating

Council for Disaster Management," it was argued that the country needed to manage disasters (both natural and manmade) in different phases, such as prevention, mitigation, emergency response, rehabilitation, and reconstruction.

The 1992 Flores disaster has been remembered as one the largest-scale disasters in Indonesia at the end of the 20th century; it taught important lessons to the central government, as stated by a former Minister of Finance that "Flores goes back to the pre-development era before 1970" because the destruction of the development infrastructures and people's assets invested over a quarter century had set the region back to poverty in only a few hours. This awareness is well recorded in a local newspaper (Ministry of Finance's explanation in Tabloid Dian, January 1993). However, this national disaster was not translated into a nationwide transformation of disaster mitigation and preparedness, which did not happen for almost 15 years.

The reason that the government declared the Flores tsunami in 1992 as a national disaster was that the tsunami had caused "suffering, loss of life, and enormous material losses to society. Considering the impact of such a disaster and the need for response efforts and recovery, it is deemed necessary to establish the national disaster status" (Presidential Decree No 66/1992 on Decision on Status of Flores Natural Disaster as National Disaster. Page 1 points a and b). This editorial text was exactly used again following the tsunami on 26 December, 2004, with additional text to give a National Day of Mourning (Presidential Decree 112/2004 signed on 27 December, 2004).

At the end of the IDNDR period in 1999, a new presidential decree was issued to correct the one made in 1990, which was justified by stating that the National Coordinating Agency for Disaster Management had not been mandated to deal with disasters that arose from riots and mass violence. This change was partly a reactive response to the fall of the New Order regime in 1998, when violence suddenly spread in many parts of Indonesia, which was caused by many internally displacement persons (IDPs). However, the 1999 regulation (Keppres 106/1999—National Coordinating Council for Disaster Management) did not regulate the IDPs even though it was coincident with the crisis in Timor Leste together with the East Timorese refugees' influx to West Timor in 1999.

Indonesian Disaster Management Policy 2000-2007

The answer to the call for a more serious approach to IDPs (at least on paper) took place in 2001 with two sets of revisions: the first was the revision of the 1999 regulation to revise the name to the National Coordinating Council for Disaster Management and Internally Displaced People (Keppres 3/2001); this was revised again in a Presidential Decree (Keppres 111/2001) in the same year with the same title held until 2005.

Based on personal observation, the nature of this revision was probably related to the introduction of the "Guiding Principles on Internal Displacement" by United Nations

Commission of Human Rights. In Indonesia, this guideline was translated in early 2000 by civil society organizations such as Oxfam. Furthermore, the issue of IDPs came to the fore in 2001 when prominent international and multilateral agencies dealing with the refugees from East Timor in West Timor were removed from their operation in the year 2000 owing to the killing of three staff of the United Nations High Commissioner for Refugees (UNHCR) in August, 2000. With the dearth of resources to meet the basic needs of the refugees (for the East Timorese who resided in Indonesia) and IDPs (e.g., East Timor-born Indonesians and other IDPs throughout Indonesia produced by conflicts in several regions), the national government needed a new justification for financing humanitarian responses. This partly forced the government to create new rules to be legally and politically appropriate for dealing with both IDPs and refugees. Therefore, Law 3/2001 on "National Coordinating Council for Disaster Management and IDPs" was signed. For the first time, the Minister of Transmigration was included in the structure of national disaster management (i.e., Bakornas) in Presidential Decree 3/2001.

The 2000-2007 period was noted for a willingness to increase the legitimacy of the Bakornas by giving power to the vice president in terms of direct responsibility to command the system of disaster management in all four versions of Presidential Decree (Keppres) 3/2001, Keppress 111/2001, Perpres 83/2005, and Perpres 3/2007. The notion of carrying out disaster reduction beyond the government, namely, governance, emerged notably after the fall of the Suharto regime. In 2003, in the opening remarks of the *International Seminar and Workshop on Tsunami: In Memoriam 120 Years of Krakatau Eruption—Tsunami and Lessons Learned From Large Tsunamis,* the former coordinating minster of social welfare (later a vice president in 2004-2009) noted the following: "Disaster is our responsibility. Not merely government responsibility but also that of the private sector and society." This view of shared responsibility to manage risks of disasters is not new as it has existed in practice, notably since the 1990s. The speech was given exactly a year before the catastrophe of the Indian Ocean tsunami. As the Head of Bakornas, Mr. Kalla noted "it is difficult to predict when tsunamis will occur. Scientists have predicted that tsunamis can happen in a few minutes (5-20) after being triggered by earthquakes. Therefore, considering the limitation of time, there are steps that need to be taken, such as the identification of tsunami-prone areas by means of hazard and risk mapping, socialization of preventive measures for example to persuade people to stay away from risky areas, an increase in public awareness, and improvement and development of early warning systems for all kinds of hazards, especially earthquakes and tsunamis" (Kalla 2003:6).

In one of the conference papers in August 2003 entitled "General Guidelines for Mitigation of Natural Disaster in Coastal Areas and Small Islands: Special Focus on Tsunami," it was clearly noted that around 60% of cities/towns (290 out of 490 cities/towns) are situated in earthquake-prone regions (page 195) and the vast majority of these cities are potential "targets" for tsunamis. It was added that, in order to mitigate

tsunami risks, there was a need for the integration of three approaches: integrated coastal zone management, integrated fisheries management, and integrated coastal hazard management.

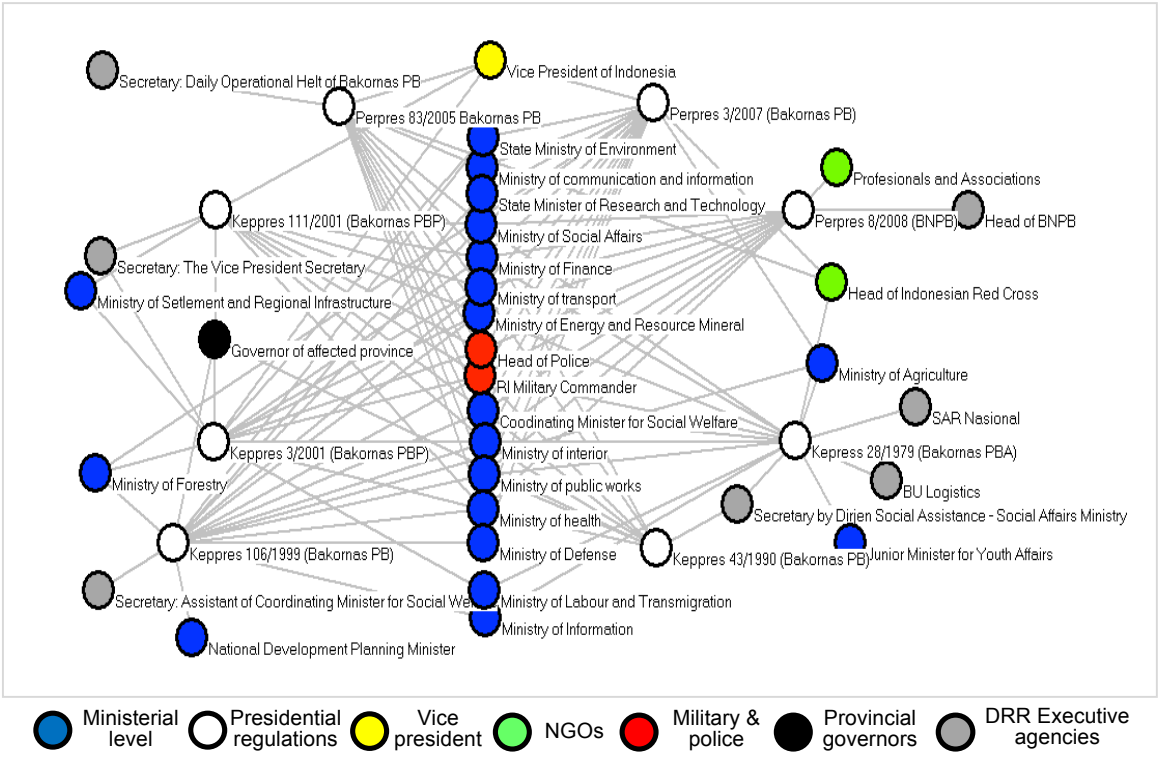
Responding to this, in the second last paragraph of his remarks, Mr. Kalla suggested that "On this occasion, I ask you to increase our attention to the efforts to undertake prevention and disaster mitigation, not only by talking, but also by doing. On the basis of all the experiences we have in this country and abroad, we can draw lessons for the future." With this statement, it was clear that the political will was there for an idea that had not been translated into the existing structure of government during that period.

How did local policymakers see the problems during this period? In a reflection on an earthquake event that scaled between VII-VIII MMI[13] on 4th June, 2000, in Bengkulu Province (in Sumatra, Indonesia) and that killed 93 people and caused 3,339 houses/buildings collapsed (not including a total of 13,756 houses heavily damaged and 29,090 houses with medium-light damage), the Bengkulu governor asserted the root causes of the damage and losses: "The shifts from wooden and bamboo house structures to masonry, while the collapsed masonry was due to the quality of the materials, the quality of joint elements of house structures such as beam-columns; each element moved not according to a single mass acceleration, and there was no stiffness in the houses; most of the buildings are situated by the fault lines of earthquakes" (Hasan 2003: 241-249). In the last reflection of the paper, especially on how provincial policy would respond to the situation, he maintained that mitigation and risk reduction measures could make structures earthquake-proof by going back to the previous building/housing patterns (wooden and bamboo structures including the use of aluminum roofs), as well as no longer building houses exactly at already recognized earthquake/fault lines or on unstable areas (hence the recognition of land use policy design, monitoring, and enforcement; in line with HFA Priority 4th); the need for new risk analysis and mapping of earthquake risks including seismic zoning in the whole province (Hyogo Priority 2nd); increasing the practical knowledge on post-disaster response to the whole society as well as recognition and greater appreciation of the embedded mitigation measures in the existing local knowledge and technology such as wooden and bamboo structures (Hyogo Priority 3rd). Such awareness and vision of risk management in many instances was unfortunately not often found in the regions where recent disasters took place. However, before Disaster Management Law 24/2007, there were hardly any policy instruments available that enabled actors with "good political will" to clearly change the knowledge into action.

Figure 1 shows the network of regulation of disaster management and the organizational ties over the period 1979-2008. Every dot represents either a regulation or an organization. The analysis is based on six different regulations and the organizational ties required by each regulation. In this analysis, qualitative explanation of the graph is important because of the interest in looking at the actors and forms of governance utilized in each period.

Apparently, the Ministry of Interior and the Military Commander have the highest connected node as they existed in all regimes of the Bakornas (National Coordinating Council) system from 1979-2007, as well as after the reform. This obviously reflects the discourse in the public where the military are still seen as an important group even after the reform, given the limitation of logistical resources within civil organizations. The figure also suggests that the Ministry of Interior is always involved in the business of disaster risk management in Indonesia. In fact, the minister is key to successful adoption of national DRR regulation into local DRR regulation.

Figure 1: Illustration of DRM Regulatory and Organizational Network 1979-2007



Source: Author. Data is coded from regulation on Bakornas 1979, 1990, 1999, 2001, 2005, 2007 and regulation on BNPB 2008.

The Ministry of Social Affairs and the Coordinating Ministry of Social Affairs as well as the Ministry of Energy and Mineral Resource are important in the disaster management system in Indonesia. The Ministry of Social Affairs used to be the long-term leader in the early form of Bakornas in 1979 and its membership in Bakornas was consistent; the Coordinating Ministry of Social Welfare took over the leadership quite a few times before it was taken under the remit of the vice president's office in 2001. The importance of the Ministry of Energy and Mineral Resources was due to its control of the Geological Services and Volcanological Survey since the 1970s. The involvement of the Ministry of Forestry in the Bakornas system was notable since 1999 owing to the forest fire problems during the El Nino year of 1997/8. The Ministry of Public Works

contributes to the system through its dual roles in the disaster management system, such as providing logistical services for post-disaster intervention such as rehabilitation and reconstruction as well as its roles in mitigation and spatial planning. The Ministry of Finance has good ties to the system because of its roles in providing support to it.

The involvement of the Indonesian Red Cross in the system started with the establishment of Bakornas in 1979. However, it disappeared in 1990-2001 regulation and re-appeared again in 2005. The inclusion of civil society in the structure formally started just after the reform in 2007. One of the recent surprises found during this research was that the current government tends to work outside the existing institutional pathways, and not always with good reason. For instance, in Figure 1, the Coordinating Ministry of Social Welfare can be seen to be involved during the last 28 years and was the host of Bakornas during the 1990s. However, in early 2010, suddenly Presidential Instruction No. 1 2010 was issued to accelerate the implementation of National Development Priority 2010. The instruction simply neglected the structure under reform by putting disaster risk reduction under the remit of the Coordinating Ministry of Economic Affairs (the acceleration of the implementation of National Development Priority 2010). This shift of policy went unnoticed among the public and the professional community. However, this needs further investigation, especially in terms of how such a change happened and whether the influence of politics may have outweighed the need for professionalism, especially in recruiting experts who have prescribed such ignorance in policy making.

One may argue that, even without the Bakornas system in 1979, the response quality might have always been the same because somehow the government would always respond (significantly or not) to disaster events and because many people (including high level decision makers such as ministers) still subscribe to the perception of disasters and catastrophes as a form of divine intervention and punishment (see Haynes et. al. 2010), so the government would barely change its disaster management strategy in substance.

Disaster Management Reform

Many agreed, especially the reformists, that the main reason for reform, including establishment of a new disaster management law, is that the old structures that had been preserved since 1979, such as the National Disaster Management Council (Bakornas) and the Satkorlak (Provincial Council on Disaster Management), as well as city/district disaster management councils (Satlak), had been extremely ineffective in dealing with not only future disaster risks but also disaster responses in the past. These old structures almost always became active when emergencies took place and the government was always caught by surprise by natural hazards.

One can rightly claim that the old structure added very little value to reduce disaster risk. *De facto*, the Bakornas system made very limited efforts in mitigation, risk

reduction, and disaster management planning in systematic ways, a point that was clearly stated in the draft academic paper 2005 version that produced by the Indonesian Society for Disaster Management.

The energy for change was finally generated by the disasters of 2004-2006. Some of the visions for disaster risk reduction stipulated in the Hyogo Declaration and Hyogo Framework for Action have been borrowed in the Disaster Management Law 24/2007. However, the term "Disaster Management", which has been considered as "old" and often signals a reactive-oriented paradigm, is still in use after the reform to encompass the whole aspect of disaster risk reduction as stipulated by the HFA. Nonetheless, this was an achievement as some of the drafters and negotiators argued that "it was difficult for the legislators to opt for risk reduction-oriented terms, as suggested in one of the drafts, so instead they ended up keeping the term "disaster management."[14]

Figure 2 is the design of the disaster management system in Indonesia after the reform combining actual compliance with the Hyogo Framework for Action. The National Disaster Management Agency superseded the *Bakornas* secretariat. At the provincial and district levels, both *Satkorlak* and *Satlak* have been replaced by a Local Disaster Management Agency. At the national level, there is a National DRR platform, which is indeed a predecessor of a multi-stakeholder forum formed in 2005 with the purpose of advocacy for the drafting of the disaster management law legitimized by HFA.

At all levels, the legislative agency should play roles for not only bill drafting and DRR budgeting but also for monitoring the implementation of the law. The national legislative body used its initiative rights for drafting the disaster management law, but it was merely as a response to the call from non-state actors to create the law in 2005. Such initiative rights have seldom been used by Indonesian legislators (Pujiono 2005). The legislative response to the call for reform was partly conditioned by large-scale disasters, which affected the national budget during 2005-2007.

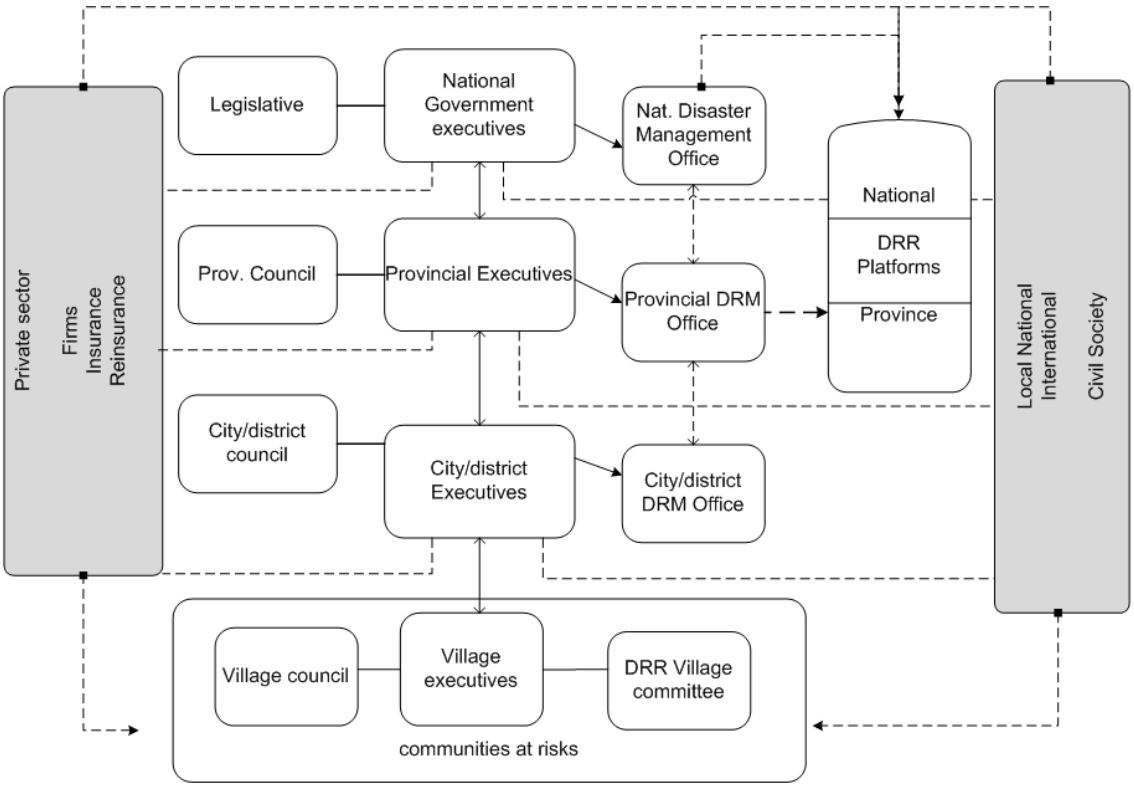
Control and monitoring of the quality of disaster risk reduction may come from civil society organizations (as recognized in Figure 2) and the media. At the local level, especially at the provincial level, a similar structure is used. A provincial platform is seen as the key to sustain the efforts in risk reduction. The very idea of such a platform is rooted in the Hyogo Framework for Action (Priority 1.4) and this is an ideal structure that, when it is expected to materialize in 33 provinces, needs a very large policy demand. In fact, the DRR National Platform has not been really functioning regularly as it is designed. In the provinces, the DRR platform can only be active where there are extra-government initiatives from either international NGOs or a United Nations agencies actively working in DRR.

At the district level, a similar structure (in practice) is utilized without requiring a DRR platform. The disaster risk management structure recognized the roles of civil society organizations as well as the need for a strong partnership with private

organizations. The next sections will show how such an "ideal" structure is made operational in the real world.

The National Disaster Management Agency (or BNPB - see its structure in Annex 2) reports directly to the President of Indonesia, but is not (yet) a member of the cabinet. There are also discussions whether the agency needs to be part of the cabinet in order to give greater power as Indonesian has experienced many more disasters occur during the past six years[15]. However, there has been no study of whether it should be part of the cabinet to increase its legitimacy and power, as is the case in some countries where disaster risks are very high and persistent, such as Sri Lanka[16], New Zealand[17], and Bangladesh[18].

Figure 2: Indonesian Disaster Management System



Discussion

From the 1930s till the 1970s, there had been very little progress made in disaster risk management policy. Even though civil society organizations have been recognized since 1946, such recognition had been barely implemented for political reasons. Thus, politics matters because Indonesia experienced three historical phases of authoritarian regimes. During these periods, military power either was superior or was considered to be superior to civil governmental organizations, such as disaster management committees in the

1960s-1970s, because disaster may have been seen as an agent that could create instability in the territory.

However, *de facto*, the emerging roles of multilateral actors since the 1970s-1990s brought new insights into the practice of disaster management in Indonesia. Unfortunately, there is barely any study of the roles of United Nations Disaster Relief Coordinator (UNDRO) during the 1970s. In the second half of the 1980s, UNDRO supported "institution building" for disaster management systems in Indonesia. *Bakornas* failed to perform following the eruption of the Galungung stratovolcano in West Java in 1982. Because of this, UNDRO later joined with the United Nations Development Programme (UNDP) and other international agencies, creating the Indonesian Disaster Management Center. Creative investment in human resource development on mitigation and preparedness was undertaken. This was achieved by investing in human resources for the Ministry of Social Affairs (the host of *Bakornas* secretariat 1979-1990), including for some relevant ministry staff seconded to the center, and conducting selected hazard research led by national experts in 1986. The output from the multidisciplinary research on disaster mitigation was planned to be integrated with the Medium-Term National Development Plan (also known as *Pelita*) 1987-1992 (Wong 1986). Such processes took place in 1986-1987, the same year in which the IDNDR was formally declared to begin.

However, the technically sound approach in capacity building had been disadvantaged by the unexpected change in the macro structure, especially when the president changed the host of *Bakornas* from the Ministry of Social Affairs to the Coordinating Ministry of Social Welfare in 1990. There is a lack of information regarding what happened with the trained individuals and their career building in the field. Nevertheless, it was clear that a change in policy, even with a good reason to shift from "natural disaster" stipulated in 1979 towards "disaster" in general (to regain command over the non-natural ones) in 1990, and to place such a mandate under a coordinating minister, in theory, might promote multi-agency efforts. Such a change was mainly a response to the IDNDR movement. However, unexpected organizational (or leadership) change from the Ministry of Social Affairs to the Coordinating Ministry of Social Affairs had encouraged discontinuity of human resources, organizational and institutional building, as the new ministerial host started human resource development from scratch, which caused the 1980s' Indonesian Disaster Management Center to become irrelevant.

The "sudden" change of disaster management policy in Indonesia in 1979 is best explained as the impact of discursive change made through national-international interactions. The persistence of the old disaster management policy before 1979 was due to the previous fatalistic paradigm on disaster going unchallenged. However, in principle, disaster management institutions in Indonesia did not change significantly from the 1960s until 1990. This was a long period when the disaster management discourse was embedded in *ad hoc* structures and the actions were reactive responses.

The legacy of the Dutch colonial government can be traced until the recent past. Another explanation could be that the DRR discourse during 1970s-1990 simply took place in the context where information, communication and telecommunication (ICT) infrastructures were not as advanced as they are today. Neither superficial nor substantive change occurs in isolation. Instead, it occurs as a result of national-international interactions facilitated by the context of when and where (the level of) such interactions take place. Recent changes in Indonesia in 2007 disaster management policy were due to discursive changes at the global level coupled with large-scale disasters in Indonesia during the last ten years. Therefore, the disaster management policy reform in Indonesia has been the result of a dual process: the dynamic context in which recurrent catastrophes provide opportunities for the (domestic actors inside and outside of) government to review its existing policy combined by international processes and platforms such as the bilateral and multilateral aid institutions that encourage the government and the non-state actors in general to change.

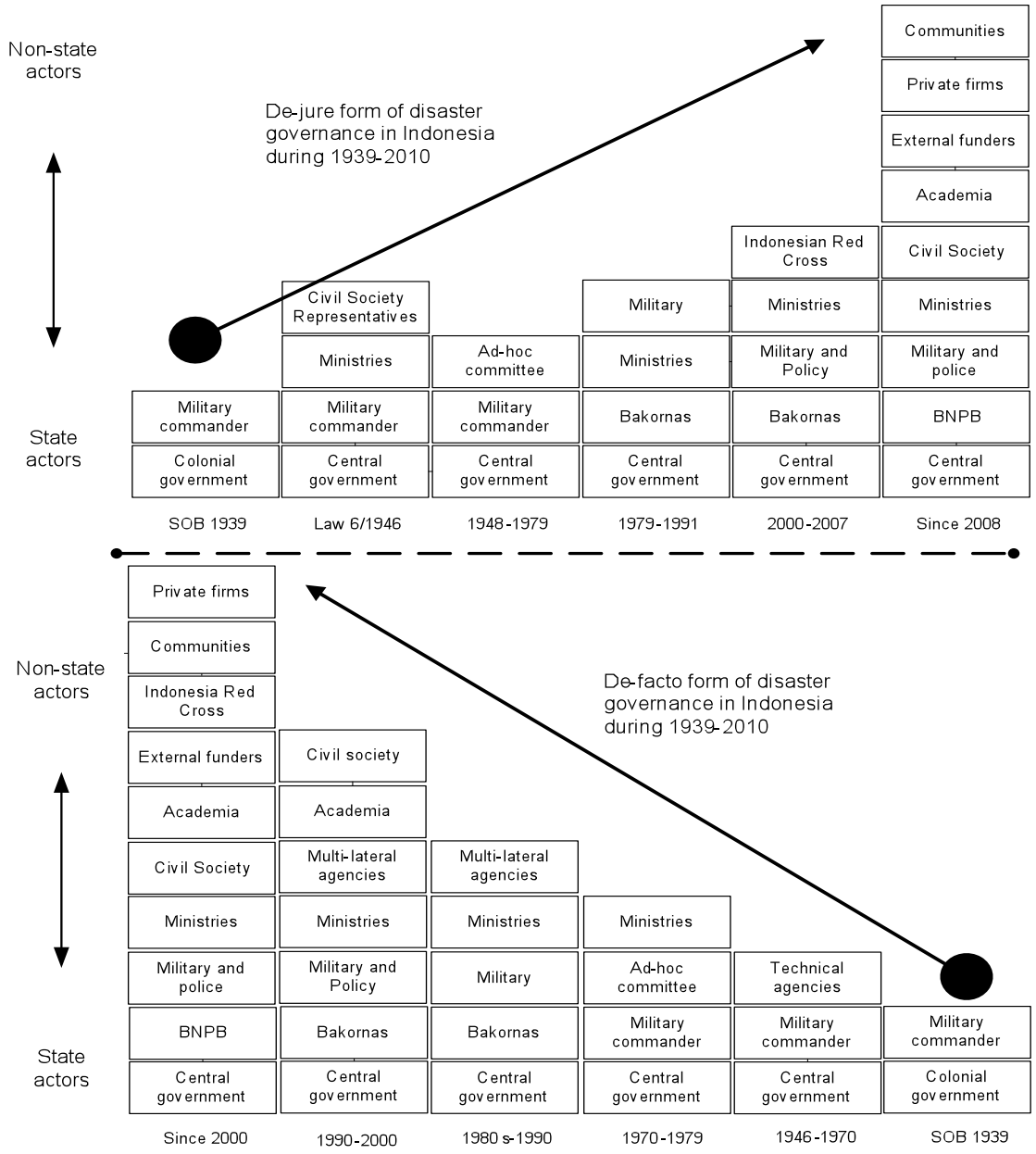
The New Order of Indonesia brought political stability during the period from the 1970s to 1990. Thus, later on, manmade disasters such as conflict and civil war were not considered major issues because the New Order regime was coercive in silencing sources of civil society power and rebellions that might challenge the government's authority. The only factor that could not be fully controlled was the element of surprise of natural disasters. This was one explanation for the New Order regime simply correcting the 1960s disaster management policy by making the ad hoc committees into a single more stable entity, namely, the National Coordinating Council for Natural Disaster Management, in 1979, which lasted until 1990.

Catastrophes during the 1990s did not bring change to the national disaster management system. One example was the first declaration of *national disaster* status after the Flores tsunami in 1992—which, for the first time (at least based on all accessible formal documents) since the formation of the National Coordinating Council in 1979—did not actually trigger any disaster management policy change at either a local or national level.

Disaster management policy reform that occurred in 2007 was not fully initiated by the formal institutions and policymakers. The reform itself has actually been a result of complex processes involving quite diverse actors within civil society and non-stakeholder actors' (see BNPB-UNDPa,c 2009) initiatives to call for the legislative agency to exercise power. The reform arose from a complex set of networks that transacted new ideas, information, and knowledge back and forth from local to international levels (Lassa 2011). This is well documented in some publications. Pujiono (2005), for instance, documented 39 meetings, many of them at the national level, from only 11 Feb-16 June, 2005, which involved international actors, civil society, the media, and individuals from non-governmental organizations (Parlan, Suratman, and Astuti 2007).

Figure 3 shows that civil society organizations and other non state actors now enjoy co-steering roles in the disaster risk reduction. The National Action Plan 2006-2009 was formally endorsed by the Ministry of Development Planning (*Bappenas*) with the support of the UNDP, and provides some interesting insights. The document provides important information regarding the involvement of multi-stakeholder efforts such as United Nations organizations, INGOs, international donors, university/research institutes, media as well as government institutions such as the transitional *Bakornas*, Ministry of Public Work, Ministry of Education, and Ministry of Interior.

Figure 3: Trends in Indonesian DRR Stakeholders



UN agencies and INGOs supported civil society advocacy under the lead of MPBI (see also BNPB-UNDPa 2009:12-13) to carry out "exhaustive" (see Pujiono 2005) consultation processes with international partners, politicians, national legislators, and government, especially Bakornas and civil society at large. Consultation processes with international actors were known as the Convergence Group, which was later supported by UNDP to form a working group for a background academic paper for law drafting. The Working Group members were all international organizations such as the UNICEF (United Nations Children's Fund), CARDI (Consortium for Assistance and Recovery towards Development in *Indonesia)*, ECHO (European Commission Humanitarian Aid department), OCHA (Coordination of Humanitarian Affairs), and IFRC (International Federation of the Red Cross). International aid interests have been successfully accommodated in the law, which was later enforced through a specific regulation, namely, Government Regulation 21/2008 on International Cooperation in Disaster Management (see BNPB-UNDPa 2009, p.13).

Some positive outcomes of the international and non-state actors' involvement in the drafting of the law lie in the details of the DM Law document. The law recognizes the government's responsibility to: (a) reduce disaster risks and integrate risk reduction in development programs; (b) protect people from disasters; (c) guarantee provision of rights of people affected and displaced by disasters according to minimum standards; (d) support recovery from the impact of disasters; (e) allocate budgets for disaster management in the country's Annual Development Budget; (f) allocate contingency funds for disaster response, and (g) provide authentic and credible documentation of hazards and impact of disasters.

Reflection and Conclusion

In regards to the question of how DRR policy changed, from the anthropological perspective, Hoffman (1999:304) argues that the variables for change are the size (magnitude of disaster, population mass, and amount of damage), time, and the thicknesses of structures of cultural institutions (such as norms, customs, traditions). Large disasters such as the Flores tsunami in 1992 and the Indian Ocean tsunami in 2004 could be seen by ordinary people, including politicians and policymakers, as events beyond their comprehension, which could contradict Hoffman's (1999) idea because the dramatic effects of the events can convey the wrong messages to the people in power. Such catastrophes are simply beyond their imagination and control. The only factors that could help them cope with such a situation are the institutions closest to them, such as religion and culture.

Repeated large catastrophic events may reinforce the belief that disasters arise from God's punishment because "immorality causes disasters," as the Minister of Information and Communication recently explained to the people of Padang (West Sumatra Province)

following the devastating earthquake there on 30 September, 2009.[19] The ministry held a position on the National Coordination Body for Disaster Management (Bakornas) in 2005 and 2007 (see Figure 1).

The historical overview in Section 3 regarding anti-colonialism in Banten following the Krakatau eruption and its associated tsunami (Winchester 2003:334) was fueled by reasoning regarding divine punishment to the non-believing (colonial) government. Recent national disaster events such as the Merapi Volcanic eruption (26 October-19 November 2010) caused more than 200 casualties and more than 350,000 displaced people (Forum PRB 2010). Cultural explanation from Javanese cosmology has been a 'coping mechanism' for the local people in Yogyakarta. Dove (2010, p.122) describes the local communities' views on the cause of the Yogyakarta earthquake, which was "seen as a divine judgment on those holding the reins of political power". Schlehe (2010, p.116) also noted that the earthquake in 2006 in Yogyakarta has put pressure on the Sultan of Yogyakarta and the President of the Republic, Susilo Bambang Yudhoyono, because "the leaders were seen as lacks blessing and legitimization from divine power".

The bigger the scale of an event that goes beyond the people's understanding of the natural processes, the more difficult for disaster risk reduction reform, especially when the local institutions are weak (e.g. endemic corruption). This causes difficulties in encouraging rational and science driven policy measures (Lavigne et al. 2008) for volcano mitigation and post disaster management and this leads to the "pull" and "push" factor in disaster risk reduction policy reform. The pull factors can be considered as constraints in the present reform as competing informal institutions, which are also legitimate stakeholders in disaster risk reduction that may facilitate enabling or disabling conditions for actual risk reduction. The push factors can be seen as initiatives from outside government and informal institutions (such as traditional institutions).

The disaster risk management reform process in Indonesia is not unique in the sense that similar efforts have occurred in other Indian Ocean countries such as Sri Lanka (see www.srilankanparliamentonnaturaldisasters.org) in 2005, as well as India in 2005 (www.nidm.gov.in/). One of the driving forces behind the reform was a form of global disaster risk governance, such as national compliance with the Hyogo Declaration as voluntarily endorsed by Indonesia together with 168 countries. As the Hyogo Framework for Action (HFA) suggested, disaster legislation is seen as the foundation that provides a strong basis for planning and directing of the whole spectrum of disaster risk reduction. The BNPB (National Disaster Management Agency) admitted that the process of reform is "based on international policy direction" (BNPB-UNDP 2009a, p.9).

Therefore, the change in the disaster management policy is shaped by a dual process. First is the risk context where catastrophes either provide legitimacy for or push the government to evaluate its disaster risk management strategy with some sort of "anticipated initiatives" coming from outside government at the national level. Second, the international processes such as the IDNDR in the 1990s and later the International

Strategy for Disaster Reduction (ISDR) era, which started in 2000, have facilitated discursive change. For example, in the Asian context, the disaster management policy discourse has been formally channeled through the Asian Disaster Reduction Centre (ADRC), which was established in 1998 and Indonesia has been a member state together with 28 countries (http://www.adrc.asia). The ADRC's annual conference has served as a regional platform where the member states report their progress of disaster risk reduction on an annual basis since 1998. The IDNDR was considered a success in its pioneering roles at the international level to facilitate the establishment of 130 national level disaster management committees/focal points (van Niekerk 2005).

It is an empirical fact that IDNDR itself emerged as a soft institution that encouraged countries to move to reduce their disaster risks. The HFA 2005–2015 demands for new institutional arrangements including attempts at institutional reforms in its 168 member states to be able to reduce their overall disaster risk. HFA in fact turned out to be a global disaster risk governance mechanism that encourages political interest in reducing disaster risk. Recent data indicates that during 2009–2011, at least 82 countries or territories were willing to provide interim report concerning progress of disaster risk reduction (UNISDR 2011).

This paper concludes that there is enough evidence that DRR policy change in Indonesia is a dual process of local and international interaction. There is a shift from government as the dominant governing power for DRR towards more hybrid actors comprising government, civil society, international organizations, multilateral organizations, private firms and academia that collectively form disaster risk governance structure with less structural hierarchy. In this context, what is needed is "a more cooperative state" (Mayntz 2003) to acknowledge the power of non-state actors. The evidence of a cooperative state is also demonstrated in the endorsement of Government Regulation 23/2008 regarding Roles of International Agency and INGOs in disaster risk reduction in Indonesia.

There should be an in-depth investigation concerning the roles of the macro political situation in the (lack of) change of DRR policy over time. Will the future disaster policy reform be driven by domestic and home grown demands for change without external drivers? What would happen if the evolution of Indonesia politics required strong opposition parties that act as catalyst for policy change? Further investigation should be done, especially a detailed analysis of how disaster risk policy making processes during 2005-2007—including contestations of ideas and how different actors build their own legitimacy. What does that mean in the actual risk reduction during the first five years of reform at both the national level and local level, especially in the complexity of decentralization Indonesia today? What can be learnt from local level DRR reform processes? In addition, further investigation in other developing countries is necessary.

Notes

1. See Indonesian Map via CIA Websites: https://www.cia.gov/library/publications/the-world-factbook/geos/id.html. Accessed on Jan 24, 2012.
2. The original term was *bahaya*, which means danger. However, in today's language, "emergency" is used instead of "danger".
3. See Epistemic Cultures are "cultures that create and warrant knowledge" and according to Knorr-Cetina (1999). "the premier knowledge institution throughout the world is, still, science." This means that science only one out of many the knowledge institutions available. Traditions and religion can partially be other type of knowledge institutions. To the author's knowledge, no study available regarding the epistemic culture within the Geological Agency during and after the colonial era. But it can be said that epistemic culture in both colonial and post colonial era must be very different.
4. In its early period, Indonesia had a prime minster, but this system has no longer been in use for 60 years.
5. It does not mention flood mitigation but simply disaster.
6. See Presidential Decree - hereafter Kepress - No 54/1961 and 312/1965 and also Presidential Decree 256/1966.
7. Based on Keppres 256/1966.
8. The Cabinet Presidium Decision 14/U/Kep/1/1967.
9. In CRED database (www.emdat.be), it claims that there were about 1,000 deaths from the 1966 eruption. However, this figure cannot be confirmed by some sources related to volcano studies.
10. Lahar is an Indonesian term for a volcanic mudflow, which has become an internationally recognized term. Please consult http://www.geology.sdsu.edu/how_volcanoes_work/Lahars.html. Accessed on August 18, 2010.
11. During 1979, West Papua and Papua regions were in the same administrative unit of West Papua.
12. http://www.disaster.go.th/html/ricb/foreign/2006/acdm/background/acdm_tor.html. Accessed on June 2009.
13. MMI is known as the Modified Mercalli Intensity Scale, ranged I-XII, The lower scale is measured by the situation in which the earthquake is felt by people while the higher scale are based on observed damage of structures caused by an earthquake. Scale VII means "Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken" while Scale VIII means "Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures.

Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned." See for more detail explanation is available from http://earthquake.usgs.gov/learn/topics/mercalli.php. Accessed on March 10, 2011.

14. Recurrent communication with Dr. Eko Paripurno and Mrs. Hening Parlan, some of the key experts behind the scenes who are part of the Indonesian Disaster Management Society.
15. See http://www.tribunnews.com/2010/11/07/komisi-viii-dpr-usulkan-bnpb-jadi-kementerian. Accessed on Nov 10, 2010.
16. Please consult http://www.dmhr.gov.lk/english/index.php Last accessed 15 June 2010.
17. Ministry of Defense and Emergency Management at http://www.civildefence.govt.nz/memwebsite.nsf. Accessed on June 15, 2010.
18. Please consult http://www.dmb.gov.bd/. Accessed on June 15, 2010.
19. See the English version from the BBC: http://news.bbc.co.uk/2/hi/asia-pacific/8384827.stm. Accessed on June 16, 2010.

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Utilising Participatory Research Techniques For Community-Based Disaster Risk Assessment

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Community-based disaster risk assessment yields the best results and most trustworthy primary data in understanding the disaster risk that communities face. Yet, most of the disaster risk assessments undertaken within South Africa exhibit very little evidence of community-based and participatory approaches. Participatory research techniques and capacity development interventions were used in a community-based disaster risk assessment project covering 22 communities in the North-West Province of South Africa. This article describes the methodology developed, as well as the resulting findings of one of these at-risk communities. The robust research approach proved to be reliable, valid, and trustworthy—and, at the same time, ensured direct community participation. A number of participatory research techniques such as transect walks, community workshops, and participatory GIS were employed. The research found that the knowledge in local communities is extremely reliable in the development of their disaster risk profile, and can mostly be unlocked through participatory methods.

Keywords: Community based disaster risk assessment, transect walk, participatory GIS, South Africa.

Introduction

Utilising participatory techniques for community engagement and development is not new (Gaillard et al. 2007; Mercer et al. 2008; Pelling 2007). Holloway et al. (2008) as well as McCall and Peters-Guarin (in Wisner et al. 2012), are of the opinion that, since

the 1980s, a range of methodologies have evolved that propose participatory approaches. Although these techniques have been known by various names such as Participatory Action Research (PAR), Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA), or even Participatory Hygiene and Sanitation Transformation (PHAST), they all use similar research tools. Each of the above has its own aims, objectives, practical implementation, and outcomes. Mercer et al. (2008) note that participatory research techniques for disaster risk assessment, have evolved out of the 'radical' paradigm (see the work of Cardona 2003, 2004, Hewitt 1983; Lewis 1999; Wisner et al. 2004) of disaster studies, which views disasters as complex socio-economic and political problems—as opposed to the 'dominant' view which places hazards at the centre of understanding people's behaviour (Gaillard et al. 2007). There has furthermore been a drive in the field of disaster risk reduction to move away from 'top-down' approaches driven by donors, non-governmental players and governments, to 'bottom-up' planning through community engagement (GNDR 2009; Hilhorst and Heijmans in Wisner et al. 2012; Van Niekerk and Coetzee in Shaw 2012; Wisner et al 2004). This does not, however mean that governments and other outside actors have no role to play in participatory community actions aimed at disaster risk reduction. On the contrary, it is mostly the 'outside' actors who are responsible for driving the participatory research process, due to the lack of skills and knowledge on the methodological implementation within many communities.

In early 2003, the South African Government promulgated the Disaster Management Act No. 57 of 2002 (DMA). As one of the very first 'new generation' laws on disaster risk management in Africa, the DMA decentralised the responsibility for managing disasters and their risks to the local government sphere. One of the most significant elements of the DMA is the emphasis on community engagement and participation in disaster risk management activities. To this end, the DMA calls for the establishment of various administrative structures in government, and the integration of disaster risk management into development planning. This profound new focus of government, however, is not uniformly applied (Botha et al. 2011). Lack of local municipality capacities, skills and understanding of disaster risk reduction necessitate many municipalities to outsource their disaster risk management responsibilities. In particular, one such responsibility is the assessment of the disaster risk within communities. Van Riet (2009), in his investigation of the methodologies applied in these consultancy projects, concludes that very little evidence of community-based approaches exists. The lack of local participation raised some very valid questions around the trustworthiness of these assessments.

This article investigates the methodology developed and applied in a disaster risk assessment project for the Dr. Kenneth Kaunda District Municipality (KKDM) in the North-West Province of South Africa. Twenty-two different at-risk communities were identified within the four local municipalities that constitute the KKDM. In particular,

this article will focus on one of these communities, namely Extension 7 in Ikageng Township which falls within the local municipality of Tlokwe. The next sections of this paper will create a theoretical basis for participatory research techniques and community-based disaster risk assessment and emphasise the existing body of literature in this regard. Next, to explain the context of the research site, a brief background study on Ikageng and Extention 7 will be provided. The research methodology will be described, highlighting the most salient issues. The findings of the research will be discussed, and in doing so the value of community-based approaches will be highlighted.

Participatory Research Techniques

Participatory research techniques, and in particular action research, are robust and versatile research and development strategies. They can be utilised to understand complex community structures and interaction, determine various types of vulnerability, assist in community capacity building and skills transfer, ensure community participation, and allow for the strengthening of livelihoods (Van Niekerk and Van Niekerk 2009). "Sixty years after Kurt Lewin proposed the concept of action research, this framework has evolved to encompass a range of applied research methodologies that promote change and empowerment at the group, organisational, and societal levels" (Gershon et al. 2008). The aim of participatory research is to merge traditional scientific knowledge and local and traditional knowledge to produce what McCall and Peters-Guarin (in Wisner et al. 2012) call 'hybrid' knowledge. Kindon et al. (2007) emphasise the fact that researchers, practitioners, and communities work together to identify problems and the actions towards its solution. McCall and Peters-Guarin (in Wisner et al. 2012) notes that participatory research, specifically PAR, is grounded in the philosophical writing of the Brazilian adult educator, Paulo Freire. Creighton (2005) in turn, provides compelling empirical evidence of the effectiveness of participatory research and citizen involvement. PAR, according to Kindon et al. (2007), have evolved out of RRA and PRA. Chambers (2007) also mentions the contributions of participatory technology development (PTA) and participatory learning and action (PLA) to the PAR approach.

McCall and Peters-Guarin (in Wisner et al. 2012) says that the PAR approach represents a higher intensity of participation compared to RRA and PRA. They have developed what they call 'ladders of participation' which are depicted in Figure 1 below. This figure gives a fair indication of the value of PAR as a method to ensure participation in research. It is thus safe to argue that by utilising PAR as a means of conducting community based disaster risk assessment, it would yield the much needed community involvement, engagement, participation and ownership of the research results. Van Riet and Van Niekerk (2012) show that community based and/or participatory techniques for disaster risk assessment produces the best results and the most trustworthy primary data in understanding communities' disaster risk profiles.

Figure 1. Intensities of Participation in Research

Intensities/types of participation	Actors – Local insiders (community members, local technicians) and outsiders (researchers, government, NGO's)	Overlap of research approaches			Some methods
		RRA	PRA	PAR	
Transformation **Initiating research**	Self-mobilisation for research. Invite outsiders to assist with research				Community's recognition of research needs. Community invitation to research
Collaboration **in decision-making re. methodology**	All actors decide on all issues including methods, 'at all stages'. Interactive				Participatory research design. Joint scenario settings. Joint assessment
Consultation **on results and (interim) findings**	Locals refine and prioritise external ideas on findings				Citizen juries/feedback/ validation workshops
Consultation **on topics and issues**	Locals refine and prioritise external ideas on topics and on information source				Pre-research workshop/ joint reconnaissance
Information Sharing	Two-way communication after the results, between insiders and outsiders				Presentations/reporting of results session
Exploitation **'Acquire information and leave' = no participation (very common)**	One-way collection of information. Outsiders 'return' some edited information to local people				Standard questionnaires/ censuses/ observation

(Source: McCall and Peters-Guatin in Wisner et al. 2012)

Community Based Disaster Risk Assessment

Evidence suggests that community based disaster risk assessment (CBDRA) yields the best results and most trustworthy primary data in understanding the disaster risk of communities (Abarquez and Murshed 2004; Holloway et al. 2008; Pelling and Wisner 2009; Wold and Shriver 1997). Since 2000, the participatory assessment of hazards, risks, poverty and vulnerability, has enjoyed growing interest throughout the world (DiMP 2007; GNDR 2009; Morrisey 2005; Pelling 2007).

It is commonly accepted that disasters have the greatest impact on the poor and most vulnerable, and its consequences contribute to maintaining states of poverty (World Bank 2001). Community-Based Disaster Risk Assessment (CBDRA) is thus most effective if focussed at grassroots level. The aim of a CBDRA is to have a transformative effect on a community (Pelling 2007) and to identify, assess, and monitor risks at a community level. This aim is similar to that of PAR (Mecer et al. 2008; Pelling 2007). The objective of CBDRA is to "foster participatory local adaptation to climate change that is focused on people's vulnerability, livelihoods, coping and adaptive capacity" (Van Aalst et al. 2008, p. 166). According to Morrisey (2005) participatory assessment is conducted in order to examine the wellbeing of local livelihoods and how they might respond should a disaster or other change (in the social, economic, political or environmental domains) take place.

An assessment of available literature indicates that there is general agreement that disaster risk reduction can be accomplished by enhancing the skills, knowledge and capacities of local communities (Cannon and Müller-Mahn 2010; GNDR 2009; Hagelsteen 2009; Holloway et al. 2008; Wisner et al. 2004). At the Kobe World Conference on Disaster Reduction in January 2005, one of the pivotal decisions was to acknowledge that the different actors involved in disaster risk reduction need to engage more methodically with risk assessment, project application, and advocacy (DiMP 2007) especially within communities. The Hyogo Framework for Action 2005–2015 (a global agreement emanating from the above-mentioned conference and signed by over 180 countries) calls on governments to enhance and support disaster risk assessment and related processes (Pelling 2007; UN/ISDR 2005). The viewpoint of the Hyogo Framework for Action, supported by research undertaken by a global civil society network (Global Network of Civil Society Organisations for Disaster Risk Reduction—GNDR 2009) is that communities should benefit from the decisions taken at a strategic level. The argument can therefore be made that it defies the point of striving towards disaster risk reduction, if good policy, legislation and strategies regarding disaster risk are promulgated, yet it is not implemented with the direct aim of reducing communities' vulnerabilities. Participation and local ownership of the disaster risk assessment process is therefore necessary. However, Pelling (2007) questions the difference between participatory assessment and other kinds of assessment. The complexity of answering this question is further hindered by the fact that every attempt to determine the difference between the diverse kinds of assessments includes the words participatory, community-based or local, and each one of these approaches is notably difficult to determine.

At present, there is no single definition for Community Based Disaster Risk Assessment, also called Participatory Disaster Risk Assessment (PDRA) by Pelling (2007). The absence of an agreed definition is not negative for it typifies the multi-faceted nature of disaster risk. Disaster risk encompasses various disciplines and can therefore, like defining 'development', not be bound to one single definition. Similarly, Pelling (2007) makes the point that a rigid policy focus on CBDRA issues might undermine the importance thereof. Regardless of the difficulty to define CBDRA, Wisner (2005) says that CBDRA is a method or process of self-assessment to determine coping and capacity against the impact of hazards (natural and anthropogenic).

Wisner's definition of CBDRA indicates that the process of CBDRA is about evaluating the coping capacity of a community in the face of specific disasters or hazards. When a community's coping capacity is determined, it is possible to develop tools that will enable that community to be more resilient towards those hazards and/or disasters. UN/ISDR Africa (2005, p. 5) defines disaster risk assessment as "the process of collecting and analyzing information about the nature, likelihood and severity of disaster risks. The process includes making decisions on the need to prevent or reduce disaster risks, what risks to address, and the optimal approach to tackling those risks found to be

unacceptable to the target groups and communities." Community risk assessment is critical in identifying, assessing and monitoring risk at a local level—with the purposes of informing the design of locally appropriate risk reduction programmes and development interventions, as well as assisting in the monitoring and tracking of risk at a community level. Chen, Liu and Chan (2006) say that, through a community-based participatory approach, community members would learn how to analyse vulnerable conditions, find ways to solve problems, develop strategies for risk reduction, and establish an organisation to implement disaster risk management tasks. Such an approach also facilitates the collection of views and ideas from the community residents about disaster experiences, hazard problems, and potential solutions through an informal, flexible and relaxing atmosphere.

For the purpose of this article, CBDRA is defined as direct participatory action by at-risk communities with the aim of applying local knowledge and experience to analyse their own coping capacities (including local resource mobilisation), elements of vulnerability, and hazard problems, in order to develop tools and strategies for disaster risk reduction and to find potential solutions to the identified problems in a relaxed and flexible atmosphere (Van Riet and Van Niekerk 2012).

Besides the definition of CBDRA above, it is crucial to realise that CBDRA can take on various formats linked to various focuses, within various disciplinary arenas (similar to that of PAR). Community as a concept is ambiguous and should be clearly defined from the start. Simply sharing a place of residence does not mean that there are any social relations between the community members. According to Pelling (2007, p. 378), one of the concerns about community as a unit of analysis and intervention is that in "the focus on majority rule in community processes, minority groups may lose out". A number of local role-players and stakeholders are involved in CBDRA. It would therefore be foolish to assume that there is only one correct way in which to conduct disaster risk assessment. CBDRA must empower a community. CBDRA stretches from the creation of awareness of disaster risks, to the empowering potential of participatory methodologies and a more instrumental use of local qualitative data. Pelling (2007) further discusses three different types of participatory disaster risk assessments: procedural, methodological and ideological. These types identified by Pelling are similar to the analysis of 'ladders of participation' as described by McCall and Peters-Guarin in Figure 1 above.

The procedural assessment distinguishes participatory assessments according to the arrangement of power and ownership in the assessment process. "At one extreme are approaches that are initiated, planned and conducted by local actors at risk, who might also be the audience for and owners of the results. At the other extreme are assessments that include local actors only as subjects for study, or as sources of data or future project inputs" (Pelling 2007, p. 376). The methodological approach differentiates between whether the methods of data collection are quantitative or qualitative. In this range of participatory assessment, the at-risk people are only seen as sources of data. CBDRA is

used here because it is thought of as more economical or faster than social survey-type data collection. Ideological assessments differentiate between emancipatory and extractive approaches. The emancipatory approach sees CBDRA as a long-term process that, in the end, influences the distribution of vulnerability and subsequent coping capacity development. Extractive approaches are mostly concerned with the collection of data that is to be used by external actors. When choosing which approach to use, one needs to consider its strategic use, its conceptual orientation, and also the position of the observer (Van Riet and Van Niekerk 2012). As the following section will show, the CBDRA approach followed in the community of Extension 7 is aimed at being emancipatory in nature.

Background on Ikageng and Extension 7

Ikageng and Potchefstroom (now part of the Tlokwe Local Municipality) have a very rich history. Du Pisani (2010) indicates that during the 19th century, the Voortrekkers moved inland and occupied various pieces of land in the vicinity of the town of Potchefstroom. Landowners and labourers resided on the same property. However, complaints arose by the government of the time regarding this communal living arrangement. Regulations were formulated in Potchefstroom, which subsequently stated that the surplus Bantu community be moved to a separate location. Houses were built on an identified site between Potchefstroom and Viljoenskroon and the first township, Makweteng (meaning "The Location" in Tswana), was developed.

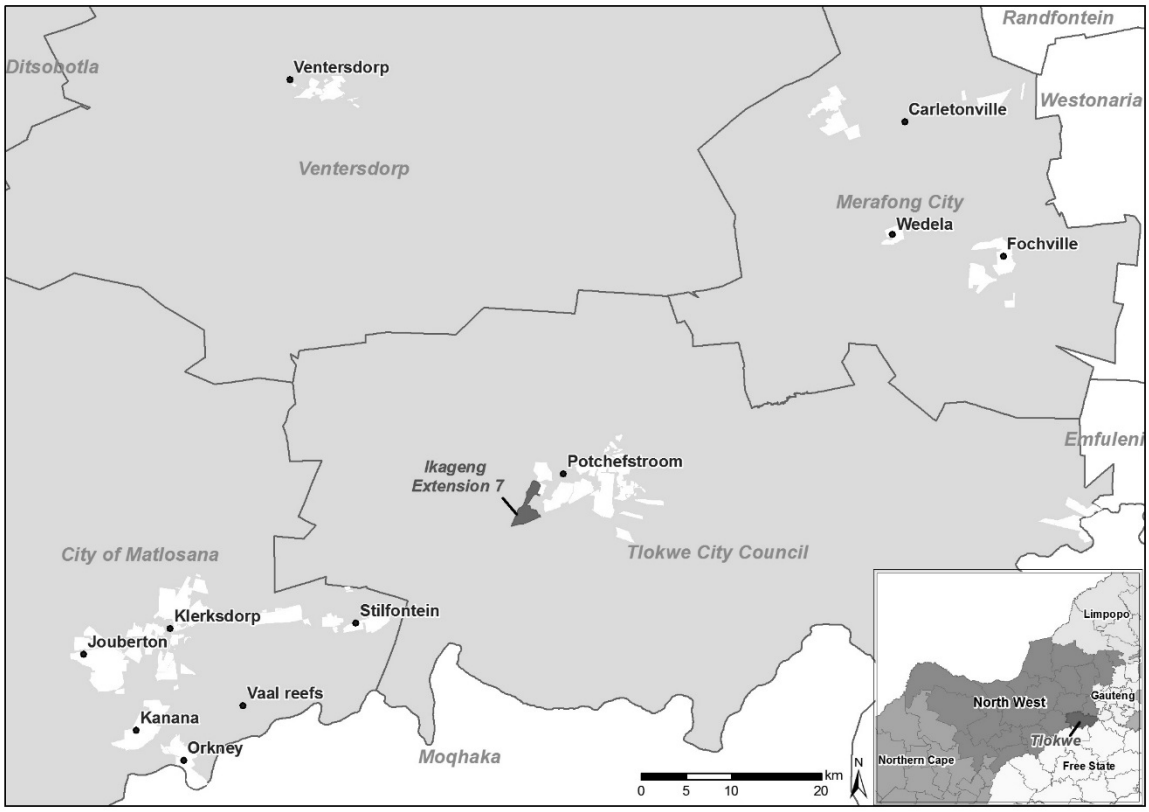
In the late 19th to early 20th century, two groups of immigrants from Indian decent immigrated to South Africa. The one group was labourers who worked on the sugarcane farms of Natal and the other group was retailers who made a living by selling various produce and products. These Indian communities came to resided in an area that was then known as the Asiatic Bazaar, a neighbourhood in Potchefstroom.

In 1951, the town council of Potchefstroom changed the name of Makweteng to Willem Klopperville, which was mostly due to the existing political climate in South Africa at the time. In 1950 the Group Areas Act No. 41 of 1950 announced that the four races—Indian, Coloured, Black Africans and White—must live and develop separated. As a result, the Bantu community was moved to the township that is now known as Ikageng in 1955, and Willem Klopperville, was zoned as a residential area for Whites. Two other neighbourhoods were established—Mohadin for the Indian community and Promosa for the Coloured community. After South Africa's first democratic election in 1994, Ikageng expanded rapidly.

After significant spatial development since the 1990s, Ikageng is located next to the town of Potchefstroom, whilst Extension 7, the community under investigation in this research, is located another 10 km further from the main settlement of Ikageng (see Figure 2). It is also one of the last settlements before reaching the neighbouring town of

Klerksdorp, and thus fairly isolated from Tlokwe's main economic activities. The combination of the legacy of Apartheid, the prevalence of HIV/AIDS, poor spatial planning, and lack of local economic development and market planning has severely hampered the community's economic and social progress.

Figure 2. Location of Extension 7, Ikageng



Extension 7 is home to approximately 26500 people constituting approximately 5300 households (Mahlabe 2011, Sehurutshe 2011, Taoleng 2011). The community lacks proper town planning and the necessary infrastructure for sustainable development. The widespread occurrence of soil pollution, water pollution and air pollution, pose a health threat as well as an environmental hazard. The community of Extension 7 was selected out of the 22 surveyed communities as the focus for this article because it possessed all of the variables in terms of prevalent hazards, vulnerability and varied capacities that provide an ideal research environment to illustrate the application of a CBDRA approach.

Research Methodology

This research intervention formed part of a larger research project commissioned by the Dr. Kenneth Kaunda District Municipality (KKDM—see the work of Van Riet and Van Niekerk 2012 as well as Van Riet et al. 2009, for a detailed account of this intervention). Twenty-two at-risk communities were identified in which three-day research interventions were implemented. The 22 communities were identified using baseline data sourced from WeatherSA, the GeoScience Council of South Africa, data from the emergency services of the Tlokwe Local Municipality, historical studies on the KKDM, reports and government documents, as well as the experiences from the disaster risk management staff of the KKDM and Tlokwe Local Municipality Disaster Risk Management Centres. Extension 7 was identified as an at-risk community due to its adherence to the broader selection criteria of all sites (Van Riet et al. 2009).

- Where are the communities frequently affected by hazards?
- Who is frequently affected by hazards?
- How are they affected?
- Why are they affected?
- When are they affected?
- What happens when they are affected? (what are the outcomes) and
- How do they currently cope with these hazards?

Before data collection could start in any of the sites, a facilitator's training workshop was held with the research teams. The researchers, government officials from the local and district municipality's disaster risk management centres, and community members formed part of the research teams. The research teams were trained in the methodology to be implemented in each of the 22 sites. A pilot study with all of the research teams was firstly undertaken to test the research methodology and determine whether the study was executable, true and reliable, and whether any revisions to the methodology were required. Subsequently each of the research teams was responsible for the data gathering in the various research sites.

Data for Extension 7 were gathered during one such three-day participatory workshop held from 29-31 July 2009 that included a transect walk through the area under investigation. Thirty community members were selected based on their knowledge of the area (years of living in Extension 7) and availability to assist the researchers. These community members were identified by government officials and the local elected community representative—who acted as the local gatekeeper to the community, NGOs and church organisations. Guidance in terms of the composition of the participants of the participatory workshop were given, which were a) an even distribution by gender and ethnicity; b) preference to be given to older people who have lived in the area for more

than 10 years, and c) representation of other groupings (such as the youth and people with special needs) should also be achieved where possible.

An even distribution of male and females for the intervention in Extension 7 was achieved. However, due to the timing of the workshop (during school hours), it was not possible to obtain adequate youth representation.

The participants of workshops were requested to identify a route for a transect walk, which should cover a cross-section of the community and would enable the research team to talk to various community members and observe the most salient hazard and vulnerability features. All the workshop participants accompanied the research team on the transect walk. The technique of participatory geo-referencing (Dunn 2007; Elwood 2006) was used during the transect walk as a source from which other relevant data was gained. Participatory geo-referencing is a geographical information management technique that utilised local and indigenous knowledge to empower communities and to explore and capture this knowledge through visual means, such as transferring their local knowledge to a map. Geographical Information System base maps were utilised to indicate basic topography, land use, and land cover, as well as socio-economic and environmental vulnerability (according to available data and previous analysis).

Findings

As mentioned previously, the community based risk assessment spanned a period of three-days (Van Riet and Van Niekerk 2012). On the first day, a historical community timeline was drawn up and an understanding of the notion of disaster risk and disaster risk assessment was created. The participants also identified and prioritised local hazards that regularly occurred. The most prevalent hazards identified by the study were floods, fires, windstorms and the mishandling of sewerage.

Floods don't only have devastating effects on infrastructure, but can also lead to the breeding of mosquitoes and subsequent diseases that, in turn, heighten health risks. The effects of floods are exacerbated by a lack of drainage infrastructure and there have been cases where children have drowned.

Fires are mostly caused by alternative heating techniques such as the burning of coal, wood, or paraffin in the residents' dwellings. Interestingly, alcohol abuse was named as one of the leading causes of fires in dwellings. These fires result when candles or paraffin lamps are knocked over accidentally because one of the dwelling residents is intoxicated. This fact was also confirmed by the incident reports of the local fire station. The residents also indicated that fires occur due to a lack of knowledge, with incorrect use and storage of paraffin and matches being listed as the main contributors in this regard.

Another hazard, ***windstorms***, has caused major damage to the community. Reportedly it happens quite often that roofs of houses and shacks are blown off and that the debris injures people. There are also cases of car accidents due to poor visibility when

windstorms occur. This is particularly relevant when one considers the geographical location of Extension 7 next to a national highway (the N12).

The incorrect disposal and treatment of ***sewerage*** poses another significant health risk for the community as it leads to a breeding ground for biological hazards. Following the hazard identification exercise, the participants documented the causes and effects of local hazards and created an understanding of the monthly and annual cycles of hazards. During the first day of the workshop the residents drew up a seasonal calendar for the prioritised risks. An example of this calendar is shown in Table 1 below.

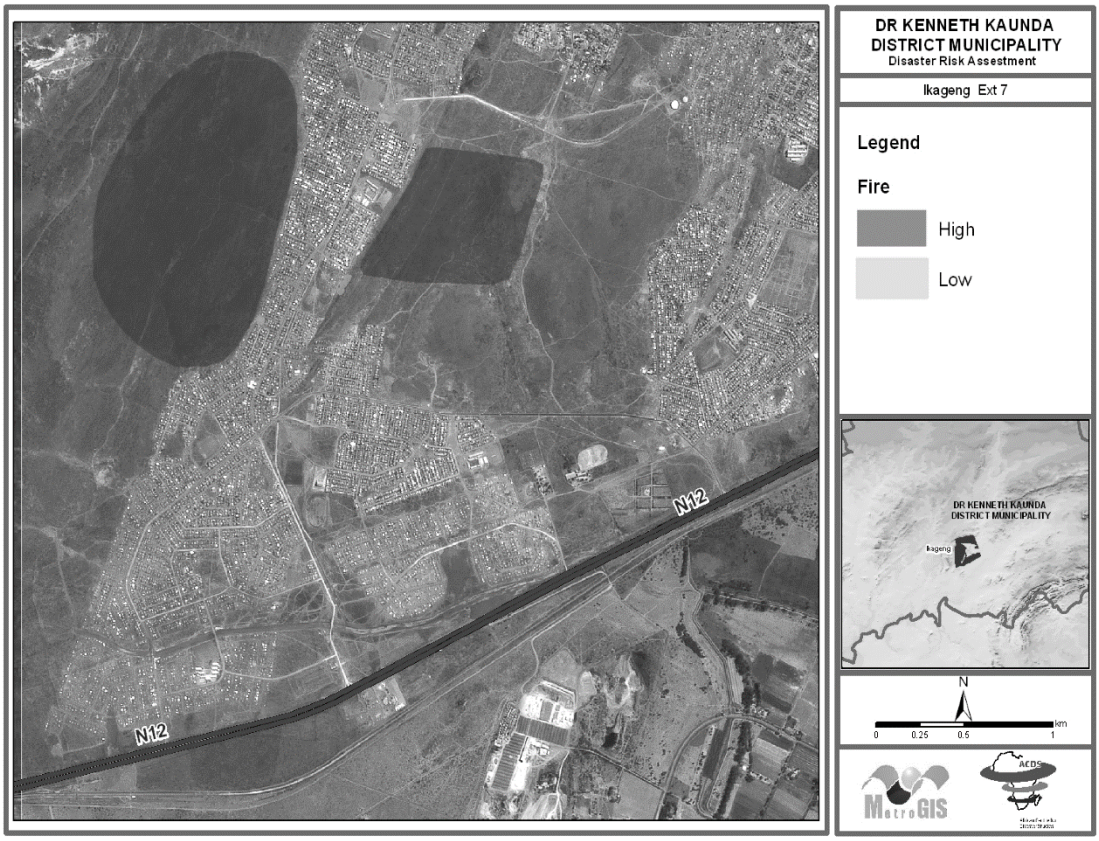
Table 1. Seasonal Calendar for Prioritised Hazards

Hazard	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Floods	●	●	●	●					●	●	●	●
Fires						●	●	●				
Windstorms	●	●	●					●	●	●	●	●
Sewerage	●	●	●	●	●	●	●	●	●	●	●	●

On the second day of the workshop, the facilitators presented a summary of the first day. Thereafter, an understanding of the settlements' disaster risk history was facilitated. The participants identified key stakeholders who might aid in mitigating hazards. During the day the participants were asked to indicate on a map which areas are most prone to the various hazards. These perceptions of the physical impact of hazards were recorded on a large geo-referenced aerial photograph (Van Riet and Van Niekerk 2012). Next, an understanding of the spatial distribution of risks and underlying vulnerability conditions were created. All workshop participants partook in a transect walk, utilising participatory geo-referencing, also referred to as participatory GIS (Dunn 2007; Elwood 2006). A transect walk is an exploratory technique in which the research team and community members walk through an agreed section of the community. This transect is agreed upon before the walk commences and should, as far as possible, be a representation of the livelihoods, activities and physical environment of the community.

During the transect walk, community members used the base maps to refine and map various features needed to gain an understanding of their disaster risk profile. All physical features in the community, for example infrastructure, development, hazards, observable vulnerabilities and overall surroundings were captured on the maps and also on digital camera. Thereafter, the location of the recordings was mapped by using Global Positioning System (GPS) devices operated by the workshop facilitators. This was in turn transferred and processed in a Geographical Information System (GIS—see Van Riet et al. 2009). The findings and outcomes of the participatory GIS intervention of the fire risk (as one example) in Extension 7, linked to its seasonality (as per the seasonal hazard calendar explained above), is depicted in Figure 3 below.

Figure 3. Example of Participatory GIS Output: Fire Risk Map



During the transect walk participants were asked to assist the researchers in pointing out the various aspects of the prioritised hazards in the area highlighted in the workshops. Issues of vulnerability were also addressed through casual conversation with various community members. As appropriate, digital photographs were utilised in the disaster risk assessment process and report writing (Van Riet et al. 2009). This also led to an understanding of the spatial distribution of key resources to reduce priority risks.

On the last day of the workshop, the participants were trained in an integrated understanding of the settlement's risk profile. All of the elements (hazards, vulnerability and community capacities and development) identified during the first two days were utilised to explain the progression of vulnerability (as defined by Wisner et al. 2004). The participants were taught that the primary strategy of vulnerability reduction is to increase a community's capacities, resources, and coping strategies. They paid special attention to the main factors that contributed to vulnerability to a specific hazard. An understanding of local disaster risk management and coping strategies for priority risks were thus created. This understanding in turn allowed the participants to make recommendations to the Disaster Risk Management Plan of the Tlokwe Local Municipality and the management of their specific risks (mostly through identifying adequate development interventions for Extension 7).

The research found that the community also suffers from significant economic vulnerability. Guillaumont (1999) describes economic vulnerability as the risk of being harmed, wounded (negatively affected) by unforeseen events, in general and in economic terms as well.

The study also found that Extension 7 has extensive environmental vulnerabilities. According to the Pelling and Wisner (2009) key aspects of environmental vulnerability include the extent of natural resource depletion and the state of resource degradation. In the same vein, a lack of resilience within ecological systems and exposure to toxic and hazardous pollutants are important elements that shape environmental vulnerability. A reduced access to clean air (as is the case with windstorms, and excessive use of open fires and coal stoves), safe water and sanitation and inappropriate forms of waste management can deepen levels of socio-economic vulnerability. A polluted environment also increases people's exposure to health risks.

As natural resources become scarcer the range of options available to the Extension 7 community becomes more limited. This reduces residents' ability to develop coping solutions, which are needed for local hazard resilience and recovery following a disaster. Over a period of time, environmental factors can increase vulnerability further by creating new and undesirable patterns of social discord, economic destitution and eventually forced migration of entire communities (Holloway 1999, Wisner 2005).

It is important for the community to build upon existing coping strategies in order to develop more resilient livelihoods (Holloway et al. 2008), reduce various forms of vulnerability, and mitigate the possible impact of the identified hazards. During the last session of the workshop, participants were encouraged to indicate gaps in the current disaster risk reduction measures. According to Annandale (2010) the participants developed the following disaster risk reduction recommendations:

- A fence should be put around the local section of the water channel and the manhole covers should be policed in order to reduce the risk of drowning during a flood.
- A bridge should be built over the channel so that people can cross the channel without having to enter the channel.
- Education about flood risk should be provided.
- Proper paraffin safety must be promoted through community actions and advocacy.
- Hazard awareness campaigns should be provided at schools so children can be taught about the dangers of fires and how to swim.
- More trees and grass should be planted in order to mitigate the effects of windstorms.
- A better and adequate sewerage system must be implemented.

Following these recommendations, numerous strategies for action were discussed. Once an agreement among the participants was reached, the facilitators recorded strategies on site level reports (Van Riet and Van Niekerk 2012). These strategies included action steps, the actors involved, including the communities most at risk, as well as timeframes for action. Lastly, a clear understanding of follow-up actions and institutional arrangements by different role players was emphasised. All the recommendations and follow-up actions were subsequently included in the draft Integrated Development Plan (IDP) of the Tlokwe Local Municipality, as well as Disaster Risk Management Plans of the municipality and the district. At time of writing of this article the draft IDP of the municipality was still under development and it stands to be seen how many of the recommendations and projects identified by the community will find actual application in development initiatives in the next five years.

Lessons Learned

A number of lessons can be learned from the implementation of this specific participatory research methodology. These lessons relate to the use of a CBDRA methodology, as well as the actual implementation of a CBDRA project. Utilising CBDRA is very time consuming and requires specific skills. Adequate time must be allocated for capacity development (researchers as well as community members), testing methods, data analysis, and interpretation. The process of CBDRA will fail unless it is owned by the community under investigation, Thus future research will do well in engaging communities directly rather than overly relying on a single gatekeeper. This does not, however, remove the importance of an appropriate gatekeeper.

A number of lessons can be learned from the implementation of this project. Firstly, the timeframes allocated for the various community workshops were not adequate. This resulted in a bottleneck in which human resources and capacities to facilitate the workshops became strained. In planning such interventions, one should provide for at least double the amount of time of a workshop in its administrative planning, even though one might be replicating an established methodology, as was the case of this project. Secondly, an over-reliance on one set of researchers to facilitate the workshops led to a shortage of skilled facilitators. Provision must be made for unforeseen circumstances in which a key researcher might not be able to be present in the research field on the planned dates. A suggestion would thus be to always have a skilled secondary research team which can be called upon should the need arise. This is imperative, especially when one is dealing with a number of community members who commit their time to be part of a research project. Thirdly, representation at the workshop(s) was problematic because the gatekeeper to the community sometime identified individuals only from his/her politically affiliated organization—thus excluding minority groups. Where local NGOs and church organisations were involved in the identification of community members, as

was the case with Extension 7, much better representation was gained. Lastly, and most importantly, a period of reflection is necessary after such an intervention. The scope of the overall project (assessing 22 communities) did not allow for a critical reflection at site level. Such reflection would allow for the re-evaluation of the data and would also assist in gaining more in-depth knowledge on the disaster risk profile of the community, especially when the community members had time to reflect on the process and their own learning.

Conclusion

This research has found that participatory disaster risk assessment is a valid and reliable research tool. By implementing a robust methodology aimed at community level analysis, this research found that very good results are achieved by engaging the community because ownership of planning for disaster risk reduction and development are significantly increased at local level. Participatory research techniques involving community consultation through a structured workshop, a transect walk and participatory GIS techniques enhanced the depth and understanding of the disaster risk profile in Extension 7. The research showed that the local community already has a significant understanding of hazards and their consequences that enhances the understanding and analysis of disaster risk and development issues. It furthermore gives insight into what the communities see as important for them to protect and how they would like to achieve this goal through development interventions. The participatory process followed in this research showed that communities' capacities to utilise their knowledge can be developed and also applied in order to influence activities aimed at risk reduction. The residents of Extension 7 were given the opportunity to directly influence their development path through this participatory research intervention. More so, this participatory intervention assisted in building local knowledge of disaster risk and enabled community members to voice their own perceptions and concerns about their disaster risk profile.

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The Role of the State in Building Local Capacity and Commitment for Hazard Mitigation Planning

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State governments play an important, but little understood, role in hazard mitigation through the use of a number of capacity building initiatives intended to assist communities develop hazard mitigation plans and policies. The passage of the Disaster Mitigation Act of 2000 more than 10 years ago provides a baseline from which to assess the degree to which states have developed and applied the tools, funding mechanisms, programs, and policies to help communities achieve this important objective. In this article, several state-level measures are analyzed and discussed relative to the degree to which they facilitate an enhanced local capacity to engage in hazard mitigation activities, including planning. The measures include: state hazard mitigation staffing; state hazard mitigation funding, policies, and programs; state cost-sharing of hazard mitigation programs; and state delivery of hazard mitigation technical assistance. The findings suggest that states maintain a wide variation in state capacity and commitment to support local hazard mitigation activities, including that which is influenced by disaster-based funding. They also tend to emphasize building local governments' capacities to gain access to project funding rather than focusing on helping them identify and establish a comprehensive, proactive, and sustained risk reduction strategy grounded in land use policy. In addition, state land use policies are not well integrated into state hazard mitigation plans and capacity building initiatives. Finally, state mitigation officials believe that most local governments do not possess the capacity or commitment necessary to develop sound hazard mitigation plans or administer hazard mitigation grants.

Keywords: State hazard mitigation planning and policy, building local capacity and commitment, Disaster Mitigation Act of 2000.

Introduction and Background

States play a number of important roles in guiding and supporting local hazard mitigation actions that reduce long-term risk to people and property from hazards. State activities that advance local hazard mitigation include serving as a transmitter of information (e.g., new federal and state policies and rules), provider of data, creator of policy, intermediary between federal policies and local actions, evaluator of local hazard mitigation plans and hazard mitigation grant applications, and builder of local capacity and commitment to hazard risk reduction initiatives through state-level training and outreach programs (Godschalk et. al 1999; Smith 2011; Smith and Wenger 2006, p. 242-245; Waugh and Sylves 1996). State mitigation efforts can also foster intergovernmental coordination (Burby and May 1997, p. 141-142; Burby and May 2009), enhance local plan compliance with broader state goals (Godschalk, Brower, and Beatley 1989, p. 126-127; Deyle and Smith 1998), and assist communities to resist or absorb and rapidly recover from disaster impacts (Beatley 2009; Peacock et al. 2009).

Although several studies evaluated state hazard mitigation efforts in the 1990s (e.g., Burby and May 1997; Deyle and Smith 1998; Godschalk, Brower, and Beatley 1989; Godschalk et al. 1999), research on the state-local relationship in hazards mitigation has not been conducted since the passage of the Disaster Mitigation Act of 2000 (DMA) (Smith 2011, p. 45; Smith and Wenger 2006, p. 242). As will be discussed, the DMA created a new intergovernmental policy framework for hazard mitigation that formalizes and strengthens states' role as a coordinator between local and federal mitigation efforts.

The overarching research question posed in this paper is—What activities have states undertaken to assist local governments to build the capacity needed to develop hazard mitigation plans and policies in light of the requirements of the Disaster Mitigation Act of 2000? Specifically, how do states vary in terms of the staff available to carry out state hazard mitigation goals; how do states vary in terms of funding, policies, and programs to carry out state hazard mitigation goals; how strong are states' local capacity and commitment building efforts to translate federal mitigation policy into local mitigation planning through the delivery of technical assistance; and to what degree are states encouraging local governments to integrate land use planning approaches into mitigation planning and how successful are these efforts?

This article begins by reviewing the literature on state capacity and commitment to support local mitigation efforts and develops a conceptual framework to guide the study. The key provisions of the DMA are then described. Next, the research design, data collection, and analysis methods are reviewed. Findings on state mitigation programs are then presented and compared to findings from previous studies. Finally, the article offers conclusions about key findings and a series of policy recommendations.

Conceptual Framework for Assessing State Mitigation Programs

State mitigation programs fill essential, multi-faceted roles in guiding and supporting local mitigation efforts to achieve national, state, and local risk reduction goals. Studies undertaken in the 1980s and 1990s before the passage of the DMA conceptualized the key capacity and commitment building dimensions of state mitigation programs (Burby and May 1997; Deyle and Smith 1998; Godschalk, Brower and Beatley 1989; Godschalk et al. 1999). These studies are used to identify the core conceptual dimensions in this study and more recent, post-DMA research are used to further specify the concepts.

For this study, we conceptualize six dimensions of state-level activities that are focused on building local governments' capacity and commitment to develop and implement hazard mitigation plans and policies. The first dimension, *state hazard mitigation staffing*, consists of the personnel that provide technical support, training, and assistance for local planning, as well as management and administration of mitigation programs (Godschalk et al. 1999). Second, *state mitigation program funding, policies, and programs* address whether a state employs a balanced, coordinated approach or a disjointed patchwork of support for local efforts (Burby and May 1997; May and Deyle 1998). Third, *state cost-sharing of hazard mitigation programs* assesses the degree to which state or local financial resources are used to cover non-federal financial grant requirements. Fourth, *state delivery of hazard mitigation technical assistance* evaluates the degree to which states help local governments build their own capacity (Brody, Highfield and Kang 2011; Burby and May 1997).

For the fifth and sixth dimensions, we conceptualize specific aspects of local mitigation efforts towards which state government agencies can target capacity and commitment building efforts. *State encouragement of local awareness of mitigation* is an important precondition that local governments have struggled to achieve (Mileti 1999; Godschalk, Brody, and Burby 2003). Sixth, *state encouragement of applying land use approaches to mitigate hazards* is widely recognized as a key to a proactive, sustainable mitigation strategy (Burby 1998; Godschalk et al. 1999; Mileti 1999; National Research Council 2006; Olshansky and Kartez 1998).

Overview of the Disaster Mitigation Act

Congress passed the DMA to spur states and local governments to develop better hazard mitigation plans that more effectively speed the expenditure of post-disaster mitigation funding and reduce rising disaster costs. The DMA requires states and local governments to develop hazard mitigation plans that comply with the standards established by the Federal Emergency Management Agency (FEMA) to remain eligible for certain types of federal hazard mitigation assistance before and after presidentially-declared disasters.

The DMA emphasizes grant administration, which dates back to the initial formulation of the Act. That emphasis was based, in part, on the idea that the development of state and local pre-disaster hazard mitigation plans would speed the implementation of post-disaster Hazard Mitigation Grant Program (HMGP) funds. At the time, FEMA was facing severe criticism from the Government Accountability Office and members of Congress due to large unspent balances in the HMGP following a number of federally-declared disasters and the slow speed at which funded projects were being implemented (Smith 2009a, p. 229).

A second principal aim of the DMA was to reduce escalating disaster losses through a more proactive and comprehensive approach to risk reduction. Following major disasters, expenditures from the federal disaster relief fund and emergency supplemental appropriations can exceed billions of dollars. According to the Office of Management and Budget, federal assistance averaged $11.5 billon per year between 2001 and 2010 (2011, p. 4). Growth in federal disaster declarations and their associated costs has led to funding more recent response operations while withholding hazard mitigation and disaster recovery funds from other federally declared disasters (Hodge, Fleisher, and Gershman 2011).

In addition to the emphasis on post-disaster hazard mitigation grants, the DMA resulted in the creation of the Pre-Disaster Mitigation program (PDM). Although the PDM represents a potentially important part of a federal emphasis on pre-event risk reduction (including the provision of funding to assist local governments develop hazard mitigation plans), it is a highly competitive grant program that tends to benefit those that have the resources required to develop viable applications (Association of State Floodplain Managers 2006, p. 3; Smith 2011, p. 65).[1] Furthermore, funding is small relative to national demand (Association of State Floodplain Managers, 2006, p. 2; McCarthy and Keegan 2009, p. 13).

Under the DMA, FEMA designates state hazard mitigation plans as enhanced or standard plans.[2] The distinction between standard and enhanced plans is largely based on a state's ability to show greater proficiency in grants administration, although states are also requested to "demonstrate a broad, programmatic mitigation approach" (FEMA 2008, p. v), an ill-defined criterion (Government Accountability Office 2007; Smith 2008a, p. 229).[3] Enhanced plans, which enable states to receive additional post-disaster hazard mitigation funds, represent an effort by FEMA to encourage the development of higher quality plans. Recent research on the quality of state hazard mitigation plans indicates that enhanced plans (e.g., Georgia, Pennsylvania, and Virginia) did not exhibit high quality across multiple planning elements (Berke, Smith, and Lyles 2012).

The issues surrounding the standard/enhanced classification system, increased spending on disaster relief, and the competitiveness of the PDM represent the latest evidence of long-standing problems in U.S. hazard mitigation policy. The nation struggles to provide an appropriate balance between post-disaster assistance and building

a partnership that includes federal, state, and local government stakeholders focused on reducing hazard vulnerability through pre-event hazard mitigation planning and policy making.

Research Design and Methods

To assess the state role in mitigation, we used multiple sources of evidence, including mail surveys, telephone interviews with State Hazard Mitigation Officers (SHMOs),[4] reviewed archived documents, and used previously conducted plan quality analyses. This allowed the study team to compare and analyze the results.

Sample Selection Criteria

The coastal state hazard mitigation program is the unit of analysis for this study. Coastal states were used because their local communities tend to experience high growth pressures and high vulnerability to hazards (Brower, Beatley, and Schwab 2002; NOAA 2004). Six coastal states were included in the sample using criteria developed to ensure variation across the conceptual dimensions of capacity and commitment and enable comparisons of our findings with studies of pre-DMA state mitigation programs.

The two criteria used, based on an analysis of 30 coastal state plans, were the strength of a state's planning policy context, and the quality of the state's hazard mitigation plan. Using Institute for Business and Home Safety/American Planning Association survey data, we defined state planning contexts as "strong" if the state had a comprehensive planning mandate that included a required hazards element, "moderate" if the state had a comprehensive planning mandate but no hazards element, and "weak" if there was no planning mandate (Schwab 2009). State plan quality was defined as "strong" if the plan score was in the top 20% of the 30 plans reviewed, "moderate" if it was in the middle 60% and "weak" if it was in the bottom 20% (Berke, Smith, and Lyles 2012). The six states selected varied across the two criteria and included two Pacific coast states, two Gulf Coast states, and two Atlantic coast states. Florida and North Carolina were strong on both criteria, California had strong plan quality and moderate planning context, Washington was moderate on both criteria, Texas had moderate plan quality and weak planning context, and Georgia was weak on both dimensions.

Data Collection

Mail surveys were administered to the SHMOs in each of the six states in late 2010 and 2011. The surveys included quantitative, qualitative, and open-ended questions addressing mitigation-relevant state legislation and programs, state staffing, funding support for local mitigation, and state technical assistance. Upon receiving and reviewing

the mail survey results, we conducted semi-structured phone interviews with the SHMOs and, in some cases their staff. Interviewees received the questions in advance, which focused on stakeholders engaged in mitigation, capacity to conduct state mitigation planning and to support local mitigation, linkage of mitigation with land use planning, and factors driving mitigation successes and setbacks. In addition, we reviewed multiple documents including mitigation studies, written policies and program guidance, and memoranda. Copies of the survey and interview protocols are available at http://www.ie.unc.edu/cscd/projects/dma.cfm

Data Analysis

Following Yin (2009), we synthesized the data in the state case studies to enable cross-state comparisons. We focus on commonalities and divergences across the six states to identify patterns across the states. We tabulated the mail survey results, extracted themes and quotes from interview transcripts, and pulled relevant information about state capacity and commitment from mitigation plans and other documents.

Results

The results are framed according to six dimensions—state hazard mitigation staffing; state hazard mitigation funding, policies, and programs; state cost-sharing of federal hazard mitigation programs; state delivery of hazard mitigation planning technical assistance; state encouragement of increased local awareness and commitment to hazard mitigation; and state encouragement of local land use planning.

State Hazard Mitigation Staffing

Staffing figures varied widely across the six states with Florida maintaining a staff that is more than twice as large as California's (Table 1). Florida bolsters their existing staff with a summer intern program that draws master's students from Florida State University's Department of Urban and Regional Planning. Georgia, North Carolina, and Texas maintain similarly sized staffs, whereas Washington possesses the smallest staff. These numbers are substantially higher than the staffing levels found by Godschalk, et al. (1999, p. 472), who noted that—in the 39 states assessed—over three quarters of states had fewer than five hazard mitigation staff and approximately one half of states had one staff person or no one tasked with hazard mitigation activities.

Assessing the total size of hazard mitigation staff (measured as those working in state emergency management agencies dedicated to hazard mitigation activities) does not fully characterize important fluctuations in the size of a state's hazard mitigation workforce and changes to the makeup and experience of personnel over time. Contextual and

temporal issues affecting staff size include the presence, in states such as California, of a robust, multi-dimensional set of hazard mitigation policies administered by other state agencies. Since this study only assessed the number of state emergency management agency officials dedicated to hazard mitigation activities, recorded hazard mitigation staffing levels probably underestimated overall capacity. The degree to which state emergency management staff coordinated with other state officials to achieve broader hazard mitigation aims will be discussed later in this paper.

Table 1. State Hazard Mitigation Staffing Patterns

States	California*	Florida*	Georgia*	North Carolina	Texas	Washington*
Agency						
Management/ Administration	11	5	4	4	8	1
Technical	2	3	0	1	0	0
Field Support/Training	0	15	0	0	0	2.5
Planning	6	4	1	4	2	1.5
Other	0	3	3	3	0	0
Field Staff						
Management/ Administration	0	2	0	0	3	0
Technical	0	7	0	0	0	0
Field Support/ Training	0	9	2	0	0	0
Other	0	0	1	0	0	0
Total	19	48	11	12	13	5

* Enhanced state hazard mitigation plan status (as defined by FEMA) requires meeting higher standards of practice than a standard plan (no asterisk).

Georgia does not face the same degree of hazard vulnerability, extent of land area, or number of local governments as Texas, Florida, or California. Although Georgia reported that the ability to provide good pay and benefits has led to the development of a stable and experienced mitigation planning staff, the number of employees administering hazard mitigation grants who leave for other job opportunities remains high. Florida noted high staff turnover across the board, citing low pay for state government personnel, even though the state maintains 15 agency staff working directly with local governments—which represents a significant commitment to local capacity building. Each state also supports a staff dedicated to hazard mitigation planning, with California possessing the largest number of positions focused on this task.

The fluctuation in size and experience levels of state hazard mitigation staffs was cited by SHMOs as a major problem (see also Burby 1995; Burby and Patterson 1993). Following Hurricane Floyd in 1999, the North Carolina hired and maintained a staff of 50

hazard mitigation planners, grants managers, and risk assessment personnel for several years. Most of these positions were time-limited because they were paid by federal funds associated with the administration of post-disaster hazard mitigation grants.[5]

The ability to hire and maintain adequate staff that can capture and transfer institutional knowledge gained over time remains an ongoing challenge. One SHMO noted that they had recently filled all of their positions for the first time in six years. Texas, like other states, has relied heavily on post-disaster administrative funds to carry out a number of hazard mitigation initiatives. Of the 13 hazard-mitigation positions in Texas, all but two (the SHMO and one Hazard Mitigation Planner) are paid from post-disaster administrative funding.

State Hazard Mitigation Funding, Policies, and Programs

States exhibit a diverse set of funding, policies, and programs aimed at building the capacity needed to address hazard mitigation-related issues. In California, for instance, the Department of Water Resources California Levee Bond Funds total $500 million dollars and are used to rehabilitate state and federal levees that protect local communities and infrastructure. California also passed state law AB 2140, which provides an incentive to incorporate hazard mitigation into the safety element of local comprehensive plans through the provision of additional state funds following a federally declared disaster.

State officials in Florida noted their emphasis on building and sustaining partnerships with the insurance industry, the state homebuilders association, water management districts, the Florida League of Cities, and the Florida Association of Counties, among others. These partnerships have led to a number of important state programs, including, for instance, the Residential Construction Mitigation Program, which sets aside $10 million per year. Of this amount, $7 million is allocated for wind hazard retrofit projects, a mitigation outreach and education initiative, and building code-related efforts. Three million dollars is also allocated to retrofit state evacuation shelters. The Residential Construction Mitigation Program is funded through the Florida Hurricane Catastrophe Fund.

North Carolina emphasizes pre- and post-disaster state hazard mitigation programs, both of which were initially triggered by special legislative appropriations following Hurricane Floyd, the worst disaster in the state's history.[6] The programs include the provision of a state match for HMGP, the creation of the State Acquisition and Relocation Fund (SARF), and $30 million to create the North Carolina Floodplain Mapping Program (NCFMP). The SARF provides up to $75,000 in state money to low-income residents participating in the relocation of flood-prone housing under the HMGP because the federal program can only provide pre-disaster fair market value for the structure. The provision of additional state funds is intended to serve as an incentive for low-income residents to move out of the floodplain and into safer housing. Under the

North Carolina Floodplain Mapping Program, the state has assumed the traditional federal responsibility for the re-mapping and updating Flood Insurance Rate Maps. The state match and SARF are now codified in state law, and are part of a tiered disaster declaration process in North Carolina, whereas the NCFMP receives a mix of state and federal dollars to maintain the program.

As part of the state's tiered disaster declaration system, NC Senate Bill 300 requires the adoption of a local hazard mitigation plan in order for communities to remain eligible to receive state assistance following smaller events that do not meet federal disaster declaration criteria. North Carolina's decision to link the presence of a hazard mitigation plan to grant eligibility predates a similar federal requirement later promulgated under the DMA.

The state of Washington administers three programs, including the Disaster Response Account, the Flood Control Assistance Account, and Flood Damage Prevention Grants. The Disaster Response Account, administered through the Military Department (the State Emergency Management Division's administrative location), amounts to $7 million. The purpose of the program, which is supported by state general funds, is to provide the state match for HMGP and Public Assistance for federally-declared disasters.[7] The Flood Control Assistance Account Program, which is administered through the Department of Ecology, was $2 million for 2009-2011. No funds were appropriated for 2011-2013.

Historically, the program provided $4 million per biennium to local governments. The purpose of the program is to pay for comprehensive flood management planning and flood damage reduction projects. The Flood Damage Prevention Grants, also administered through the Department of Ecology, represent a one-time appropriation through the state capital budget of $1.35 million during years 2009-2011. The program funded local projects designed to prevent flood damage.

The General Land Office, which is responsible for managing 20.4 million acres of land and mineral rights in Texas, administers the Coastal Erosion Planning and Response Act (CEPRA) program. The goals of CERPA include protecting public infrastructure, valuable habitat, public and private property, and natural resources; mitigating storm damage; and partnering with local, state, and federal agencies to increase funding opportunities and resources. This program targets "critical coastal erosion areas" which are defined as coastal regions that have experienced historical erosion at a rate greater than two feet per year. Funding for CERPA is provided by the state but requires a local match for most projects, the amount of which varies based on the type of project.

State Cost-Sharing of Federal Hazard Mitigation Grant Programs

Another way to assess the commitment of each state to local hazard mitigation efforts is to review the amount of the non-federal match that is assumed by the state versus local governments for pre- and post-disaster hazard mitigation grant programs (Table 2). A

state's willingness to shoulder some or all of the non-federal match requirements influences the actions of local governments in two important, but sometimes contradictory, ways. For instance, as states assume more of the non-federal cost share, this can help low-income communities with high levels of socially vulnerable populations to participate in hazard mitigation grant programs that they may not be able to afford otherwise. However, cost sharing arrangements can also create a disincentive for local communities and individuals to adopt proactive hazard mitigation measures funded by local revenues or personal savings (May and Deyle 1998; Sylves 2008, p. 96).

Table 2. Grant Matching Characteristics by State

Match Payer	California*	Florida*	Georgia*	North Carolina	Texas	Washington*
State Government	0%	0%	10% for declared Counties	100% of match for HMGP; 0% for others	0%	Depends
Local Government	25%	Varies by Community	25%	25% or more	18.75% for homeowner-based projects, or 25% for other projects	Depends
Individual Property Owner	0%	Varies by Community		25% or more	6.25% for relocation projects	Depends

* Enhanced state hazard mitigation plan status (as defined by FEMA) requires meeting higher standards of practice than a standard plan (no asterisk).

In California, local government is expected to assume the non-federal match requirement, whereas in North Carolina the state picks up the non-federal match for the HMGP but not other mitigation programs. Florida requires local governments and individual property owners to assume a percent share of the non-federal match on a case-by-case basis, whereas Georgia pays 10 percent of the match for HMGP projects in any counties that has been declared a federal disaster area. Texas does not provide the non-federal share, relying instead on local governments to pick up the match for the retrofit of critical facilities and the homeowner to cover the non-federal share of housing related projects. In Washington, non-federal match procedures differ depending on the nature of the sub-grantee and the source of mitigation funding. For instance, if a state agency receives HMGP funding, the entire non-federal match is paid out of a state disaster response account, whereas when local communities receive HMGP funds, the county or municipality may pay all or half of the match depending on the nature of the project. In the case of hazard mitigation projects involving homeowners, some jurisdictions require

the homeowner to pay for half or all the non-federal match. For all other mitigation grants in Washington, local governments pay the non-federal share.

State Delivery of Hazard Mitigation Planning Technical Assistance

States provide planning support in a number of ways (Table 3). For instance, all states but Texas reported that they created manuals and guidebooks as a way to help inform local communities about hazard mitigation planning. All states host workshops and conferences to provide information and to conduct training of local officials, review local plans before their submittal to FEMA for approval, and furnish data for use in local plans. California, which noted that they did not provide direct planning assistance when questioned in the SHMO survey, later responded that they did offer assistance through the use of phone calls, email, and a web portal. California's decision to provide this type of help may be due to the strong pre-existing planning culture in the state. However, when questioned about this, the SHMO noted that this approach reflects the size of the state, which has 58 counties, 500 cities, and over 5,000 special districts, each of which could develop a local hazard mitigation plan. At the time of the survey, the state had 700 approved local hazard mitigation plans.

Other techniques, such as the identification of best practices and hazards analysis training, are provided by the states of California and Florida, with Washington offering help with the latter. Georgia developed the Georgia Mitigation Information System (GMIS), a GIS-based tool that allows local governments to map and assess the vulnerability of critical facilities. The California Emergency Management Agency, working with California Natural Resource Agency and California Polytechnic University's Planning Department faculty, has developed *My Plan* and *My Hazards*. *My Plan* is a centralized, GIS-based catalogue of hazards data for use in the development and update of local plans and *My Hazards* is an easy to use website that allows users to plug in a street address, zip code or other pertinent identifiers and get basic information on the hazards found in that area and potential mitigation measures that an individual, family or business owner might consider.

Texas does not provide direct planning assistance to individual communities, but instead relies on group training sessions because the state comprises 254 counties. Texas works closely with a number of universities that assist with state-wide risk assessments, including the University of Texas (earthquake hazard analysis), Texas A&M University (hurricane) and Texas Tech University (tornado). Funds are provided to the universities to conduct analyses and host the information on a website so communities have ready access to the data. North Carolina has worked closely with faculty at the University of North Carolina at Chapel Hill's Department of City and Regional Planning since 1996. Guidebooks have been prepared for use in training and informing local officials about the

Table 3. State Delivery of Hazard Mitigation Technical Assistance

States	California*	Florida*	Georgia*	North Carolina	Texas	Washington*
Manuals, Guidebooks	Yes	Yes	Yes	Yes	No	Yes
Case Studies With Best Practices	Yes	Yes	No	No	Yes	No
Workshops or Conferences	Yes	Yes	Yes	Yes	Yes	Yes
Hazard Analysis Training	Yes	Yes	No	No	Yes	Yes
Data for Use in Local Plans	Yes	Yes	Yes	Yes	Yes	Yes
Planning Process Training	Yes	Yes	Yes	Yes	Yes	Yes
Direct Planning Process Assistance	Yes	Yes	Yes	Yes	No	Yes
State Mitigation Staff on Local Mitigation Committees	No	No	No	No	No	No
Pre-Review of Local Plans	Yes	Yes	Yes	Yes	Yes	Yes
Connect Locals With Consultants or Regional Agencies	No	No – not consultants; Yes – other communities or regional planning commissions	No	No	No	No – not consultants; Yes – connect locals with each other
Other	Yes- via phone, email, and web portal	No	No	Yes - regional workshops outreach for soliciting projects		No

* Enhanced state hazard mitigation plan status (as defined by FEMA) requires meeting higher standards of practice than a standard plan (no asterisk).

planning process, including the application of land use planning tools and techniques to reduce future losses.

Two types of state support were less prevalent or nonexistent, including serving on local planning committees and connecting local government officials with consultants or regional planning agencies. SHMOs cited the time consuming nature of this task and the potential appearance of favoritism as principal reasons for not serving on local committees. Although most state agencies are precluded from recommending private sector contractors, SHMOs said that they did inform local officials about the potential use of regional planning organizations to help them develop and implement hazard mitigation plans. This response coincides with other research findings that describe regional planning organizations as key stakeholders involved in the writing of local and regional hazard mitigation plans and the administration of hazard mitigation and disaster recovery grant programs (Deyle 1995; May and Deyle 1998, p. 75-78; Smith 2011, 112, p. 83-85).

State Encouragement of Local Awareness and Commitment to Hazard Mitigation

Increasing awareness of hazard risk at the community level remains one of hazard mitigation planning's greatest challenges (Mileti 1999). Even though most states in our study utilize workshops and conferences and, to a lesser extent, the development of case studies that highlight best practices, several SHMOs mentioned a lack of general awareness of hazard mitigation at the community level. One SHMO described the issue of awareness in the following manner "We don't want to walk into a room of people, no matter who they are, and say "How many of you know what mitigation is? And only have a few hands go up. We want all of the hands to go up." Another SHMO noted that "I talked to an Emergency Management Coordinator who had been on the job for eighteen months and he didn't know that there was a hazard mitigation plan in place in his county until he found it in a box and he had to go find out what the plan was and what it was for."

Citing what he called an all too common occurrence associated with high job turnover at the local level, an interview respondent lamented "Assistant Fire Chief Bill calls me up and says, I'm supposed to do something called a hazard mitigation plan. What is it?" After responding that it expires in a month, the chief's response is "Well, how do I get me one of those plans? We can't hire a new person so we're not doing a plan unless you got a cookie cutter thing [plan]." The SHMO further stated that some local officials do not take the planning process seriously until a disaster strikes, realizing that a plan is required to access post-disaster mitigation funds. "You think it [developing a plan] was hard before the flood hit? How hard is it going to be after you're the responder, the recovery person, and the mitigation planner and you were too busy before? How busy are you now? So it's harder to plan now isn't it?"

SHMOs also expressed great frustration with many local governments for failing to embrace a greater commitment to the implementation of hazard mitigation measures,

including the reluctance of communities to use the results of the risk assessment found in their plans to drive the selection of hazard mitigation projects and policies. The comments of the SHMOs are comparable to findings uncovered by a meta-analysis of plan quality evaluations, including those that addressed hazard mitigation, in which the vulnerability science and locally derived mitigation actions were weak (Berke and Godschalk 2009; Berke and Smith 2009, p. 7).

Following Hurricane Ike, which struck Texas in 2008, the state received $406 million in HMGP funds. During the same event, a Congressional appropriation targeting hazard mitigation activities totaled over $3.3 billion. Yet when queried about the quality of pre-Ike hazard mitigation plans in Texas, the SHMO noted that their quality was poor and did not serve as a useful tool to pre-identify eligible projects funded by these two programs.

According to SHMOs, a number of factors have hindered the ability of states to increase awareness and commitment to hazard mitigation at the local level, including an overreliance on consultants, a lack of hazard mitigation awareness among citizens and elected officials, and the inability to identify a local advocate for hazard mitigation. Several SHMOs noted that the widespread use of consultants has hindered the planning process, often leading to a lower level of local investment in the development of a plan. Relying on a third party to do the plan has the potential to further distance local officials from the process, including the time required to garner public involvement and gain a deeper understanding of hazard vulnerability. Consultants can perpetuate mediocrity as they seek to do the minimum required to meet FEMA standards while still "breaking even" or garnering a profit from what often amount to low-cost planning grants. As one SHMO explained, "A contractor-driven plan [represents] the shortest distance between two points, achieving the minimum standards required by FEMA while ensuring they get paid. The result is a plan that has limited public involvement or clear connections between the risk assessment and the identification of local projects."

In Texas, 35% of the HMGP selection criteria are based on whether the project applied for can be found in the applicant's hazard mitigation plan. Even though this requirement is widely advertised during state HMGP and local hazard mitigation planning training sessions, only 5% of applicants comply with this policy. Local flood control districts in Texas have consistently adhered to this state policy and as a result HMGP projects are disproportionately awarded to this group. SHMOs also described cases in which consultants, local emergency managers, or others tasked with the development of plans are told by elected officials not to identify specific hazard mitigation projects or propose new policies as this might require a community to take action or be held liable for failing to do so before a disaster.

In an effort to increase awareness and commitment to hazard mitigation, California created the Statewide Mitigation Assessment Review Team (SMART). SMART comprises a group of state university faculty that conduct post-disaster assessments of completed hazard mitigation projects to document the losses that were avoided due to the

implementation of the projects before the event in question. According to the California SHMO, the results of SMART serve as an important tool to help publicize the value of hazard mitigation to those that may be skeptical of participating in such planning efforts.

North Carolina also developed a process to document losses avoided after two major hurricanes struck the eastern third of the state in the mid- and late-1990s, causing major flooding and the large-scale relocation of flood-prone housing. Two "success story" documents were created, one that qualitatively outlined the hazard mitigation programs and policies in place following the first disaster, and a second document that quantified the monetary savings achieved in those locations that were flooded for a second time where houses had since been elevated or relocated (State of North Carolina 1999, 2000). The two documents were intended to stimulate a dialogue among state and local government officials about the role of hazard mitigation framed within a larger conversation about sustainable development and convey the importance of integrating hazard mitigation into their day-to-day activities (1999, p. 5).

When asked about what made states and local governments successful, SHMOs routinely cited the presence of an advocate that not only understood the technical nature of hazard mitigation planning and its connectivity to grants management and land use, but perhaps more importantly, how to build and maintain diverse coalitions. According to SHMOs, successful plans and the hazard mitigation strategies they contain tended to be the result of a long-term commitment to generating interest, garnering political support, identifying differing technical experts, delivering sound guidance, conducting training programs, and providing data that support local efforts.

State Encouragement of Local Land Use Planning

When asked about the connectivity between hazard mitigation and land use planning, SHMOs reported that they encouraged local governments to address the issue; indeed many states require some type of policy integration through hazards mapping and other agency policies (e.g., growth management, comprehensive land use planning, local safety element). Yet when pressed, all SHMOs noted that land use was not adequately addressed in local hazard mitigation plans, even in those states with strong "planning contexts" (e.g., Florida and North Carolina) or those states that maintain efforts to encourage multi-objective planning through training and outreach programs.

According to SHMOs, most local governments sought to meet the minimum hazard mitigation planning criteria established by FEMA, which does not contain explicit land use requirements. The comments provided by SHMOs support research that has found that local hazard mitigation plans do not effectively confront land use issues (Burby and May 1997; Deyle Chapin and Baker 2008; National Research Council 2006; Olshansky and Kartez 1998). These findings have remained true over time, even as the quality of

local hazard plans has improved following the passage of the DMA (National Research Council 2006; Berke and Smith 2009).

One SHMO noted that, although the state's Growth Management Act requires the identification and mapping of flood and geological hazard areas, the development of regulations intended to limit growth in these locales is a politically charged decision that leads to a great deal of variability in the extent to which state regulations translate to action at the community level. Further, the SHMO noted that the degree to which this information is integrated into local hazard mitigation plans also varies. In part, this is due to the limited interaction between local land use planners involved in the implementation of the Growth Management Act and local emergency managers who typically lead hazard mitigation planning activities in their respective counties and communities. The lack of coordination between local emergency managers and land use planners was documented before the passage of the Disaster Mitigation Act (Kartez and Faupel 1994) and it remains a serious problem (Smith 2009b, p. 262-263). More recent research has argued that land use planners need to become more committed to hazard mitigation if land use measures are to be used for this purpose (Stevens 2010).

In a disconcerting statement about the quality of hazard mitigation planning and the DMA more generally, one SHMO stated that, given the current condition of local plans (i.e., the poor connectivity between plans and mitigation projects and the limited application of land use), he wouldn't be surprised if the program were discontinued given the large expenditures on planning and the poor results that have resulted. Although this comment reflects a highly pessimistic outlook regarding the future of the DMA and its associated policies, the broader findings of our research team have found that many indicators of plan quality and states' efforts to build local capacity and commitment to hazard mitigation planning are improving, albeit slowly, given the span of time that the DMA has been in place. The degree to which national hazard mitigation policy continues to evolve, including the development of strategies aimed at the more effective integration of land use planning and risk reduction represents one of several areas in need of significant improvement.

Conclusions

This article has described the role that states play in building local capacity to develop and implement local hazard mitigation plans and policies. The findings suggest that states have made some progress since the last state-level analysis of hazard mitigation planning and capacity-building initiatives was conducted in 1999. However, more than 10 years after the passage of the DMA, several important issues continue to affect the ability of states to assist local governments in building robust hazard mitigation plans and integrated risk reduction policies.

The study findings indicate that states maintain a wide variation in state capacity and commitment to support local hazard mitigation activities, including that which is influenced by disaster-based funding. States also tend to emphasize building local governments' capacities to gain access to project funding rather than focusing on helping them identify and establish a comprehensive, proactive, and sustained risk reduction strategy grounded in land use policy. In addition, state land use policies are not well integrated into state hazard mitigation plans and capacity building initiatives. Finally, state mitigation officials believe that most local governments do not possess the capacity or commitment necessary to develop sound hazard mitigation plans or administer hazard mitigation grants. These findings, which have important policy implications and merit attention from FEMA as well as state agencies tasked with hazard mitigation policy and local capacity building initiatives, are discussed next.

The indicators of state capability, including staffing dedicated to grants management, planning, and outreach; funding of state programs and non-federal match requirements; and state-level policies and programs vary significantly among the states queried in this study. The high degree of variation is due to a number of factors, including fluctuations associated with the federal funding of staff positions following a major disaster; a state's past history of disasters; and a state's commitment to hazard mitigation as evidenced by their willingness to pay for non-federal match requirements, create permanent positions, and maintain state mitigation programs over time.

The ability of states to translate federal hazard mitigation policy into local planning efforts is closely associated with the indicators of state capability described in the previous paragraph. These measures are supplemented by the more specific delivery of planning support, including the widespread use of planning manuals, the hosting of workshops and other training venues, and the provision of data. The ability of these measures and processes to build local capacity appears somewhat limited, as low levels of local capacity and commitment were regularly cited as a major problem, regardless of the state-level capacity-building efforts in place. When pressed during individual phone interviews, SHMOs also noted the magnitude of the task before them and cited the need for more staff to engage in expanded education and outreach efforts.

SHMOs also noted that disjointed federal hazard mitigation policies, including state and local planning standards established by FEMA, strongly influence states' actions. As a result, SHMOs tend to focus their technical assistance efforts on assisting local governments develop plans that enable access to hazard mitigation funds. Less emphasis is placed on a more systematic attempt to incorporate land use tools and techniques into local hazard mitigation plans. The SHMOs' descriptions of local governments' emphasis on the identification of hazard mitigation projects versus the application of land use planning measures is similarly reflected in the research literature. Factors affecting the reluctance of local governments to adopt preventative measures include challenges

associated with property rights, environmental management, and economic development pressures (National Research Council 2006).

The SHMOs interviewed in this study all said that they encourage local governments to incorporate land use planning techniques into their hazard mitigation plans. This information is conveyed in training programs and found in manuals developed by states. SHMOs also noted that very few local hazard mitigation plans effectively linked land use and hazard risk reduction, even in those states that maintain strong land use laws or require the incorporation of hazard elements into local comprehensive plans. SHMOs cited a number of reasons for this outcome, including local officials striving to meet minimal federal standards (that do not require a land use component); local plans being predominantly led by emergency managers rather than land use planners; and state emergency management officials responsible for the development of State Hazard Mitigation Plans having failed to develop integrated policies in partnership with other agency officials who administer state programs that include land use provisions and requirements.

Recommendations

A common thread binding the recommendations that follow is the need to enhance states' capacity to better fulfill their critical role as the lynchpin in the larger national hazard mitigation planning and policy milieu.

Improve States' Ability to Carry Out State Mitigation Goals

The variation in capabilities across states and over time has important policy implications that should be recognized and addressed through improved state and national hazard mitigation policy. Specific changes should focus on the sustained provision of pre-event resources to states to better carry out state hazard mitigation goals tied to improved capacity building delivery mechanisms and inter-agency coordination. This recommendation represents an important counterpoint to the current set of federal policies that have led to an overreliance on post-disaster assistance, including hazard mitigation (Smith 2011).

The rise and fall of state capabilities, as evidenced by changing staff levels, does not allow for a consistent approach that emphasizes the importance of pre-event hazard mitigation planning, policy making, and local capacity building initiatives. Rather, the post-disaster influx of funds and associated positions encourages the adoption of reactive state tactics, driven in large part by the desire to obtain and process post-disaster hazard mitigation funds that are largely used to address mistakes made in the past, not necessarily adopt a forward looking, anticipatory, and long-term strategy that embraces land use as a central element (Berke and Smith 2009; Smith 2009a).

Although the DMA has placed greater requirements on state officials, the availability of federal funds to hire additional permanent staff has not kept pace, remaining essentially the same since the creation of the federally funded SHMO position following the passage of the Robert T. Stafford Act in 1988. To address identified shortfalls in state capacity, this should change. Although the number of state hazard mitigation staff have increased significantly since the Godschalk et al. (1999) study of hazard mitigation, much of this growth is found in states that have experienced repeated large-scale events that trigger post-disaster administrative funds used to hire staff on a temporary basis. States have also begun to fund permanent positions and this approach should be commended and pursued when possible. Federal assistance or funds derived from other relevant stakeholders, such as the insurance industry, should be used to leverage these state-led efforts.

States have developed a range of hazard mitigation policies and programs, including those that provide local governments with needed data and training, target gaps in federal hazard mitigation assistance, and address land use. To improve their efficacy, avoid duplication, and leverage available resources, these policies should be better integrated into State Hazard Mitigation Plans. Through better state agency coordination across those agencies that manage hazard mitigation-related programs, the more effective delivery of training, education, and other forms of local capacity building should follow. This is particularly true in those cases where state agencies maintain land use planners and oversee programs that contain land use requirements.

Increase the Emphasis States Place on Encouraging the Application of Land Use Policies, Tools, and Techniques in Local Hazard Mitigation Plans

In the face of the contextual conditions described up to this point, both local and state government officials should better utilize available resources to advance a land use planning agenda that embraces hazard mitigation. Examples include the more active involvement of local land use planners in the hazard mitigation planning process and the more effective participation of state agencies tasked with land use policies and programs.

Many local officials continue to believe that hazard mitigation planning is an emergency manager's responsibility, whereas land use planners may not recognize the important role they have to play in this process (Smith 2009b, p. 262-263). Addressing these faulty assumptions requires actively soliciting the participation of land use planners; educating local elected officials about how a good hazard mitigation plan draws on the expertise of land use planners, emergency management officials, and others in a larger hazard mitigation network; and using widely accepted land use tools and techniques (e.g., site design, codes and standards, public investments, land suitability analyses, zoning, subdivision ordinances, etc.) to better address current and projected hazard vulnerabilities. Emphasizing a more balanced approach takes advantage of the fact

that local emergency managers often have a good understanding of areas prone to hazards (based on past experience), and tend to have a direct working relationship with state emergency management agencies (where SHMOs are located and hazard mitigation funds are administered). By contrast, land use planners are trained in plan making and the application of land use planning techniques to address community goals.

A similar lack of coordination was found to exist at the state level. This condition should be rectified by improving the partnership between state emergency management agencies and those who manage state programs that contain a land use policy element. Tangible actions should include the development of more integrated state policy frameworks and the development of joint training programs conducted by SHMOs and other state agency officials.

Foster State-Level Advocacy Tied to Embracing the Original Intent of the Disaster Mitigation Act of 2000.

State agencies responsible for hazard mitigation activities should take a more active role in advocating for changes in the DMA, as the current rules do not place a sufficient emphasis on policies and capacity building initiatives that empower responsible parties to achieve the original intent of the Act. For instance, current federal mitigation policy neither provides the pre-event resources needed to strengthen state and local capacity nor instills a sincere and sustained commitment to hazard mitigation beyond the minimal standards that have become an all too common criterion of mediocrity. As currently interpreted and administered, the DMA's enabling rules continue to foster state and local dependence on post-disaster grant programs rather than building increased levels of self-reliance achieved, in part, through good hazard mitigation practices grounded in proven land use planning techniques.

Advocating higher standards should be linked to the reallocation of federal, state, and local resources that are required to build and sustain the capacity of local governments and the larger network of relevant stakeholders needed to meet this higher policy threshold. However, any attempt to increase standards without building greater federal, state, and local capacity and commitment to these proposed changes in policy will result in the overall weakening of a program that still has unrealized potential, even though it was created more than ten years ago. The ability to change the current trend of escalating disaster losses in the US requires that local governments take greater ownership of its responsibility to reduce hazard risks through land use planning, states recommit their efforts to deliver the capacity building resources needed to accomplish this aim, and the federal government establish a set of coordinated policies that facilitate this process.

Notes

1. As this article was nearing submission, the funds normally allocated to the Pre-Disaster Mitigation Program were assimilated into the National Preparedness Grant Program (NPGP), which is an amalgamation of several emergency management grants. While the intent of this effort is to streamline most FEMA-sponsored grants, many have expressed concern that the PDM program as it currently exists is slated for elimination and that future hazard mitigation grant applications sought through the NPGP may be harder to obtain, as they would now compete with other disaster response-oriented applications (American Planning Association 2012; National Hazard Mitigation Association 2012).
2. An enhanced plan enables states to receive more HMGP funds than those states that maintain a standard hazard mitigation plan. In most cases, the amount of HMGP funds received by a state that maintains a standard mitigation plan are based on 15 percent of total federal disaster costs whereas states that possess an enhanced plan receive an allocation of HMGP funds equal to 20 percent of total federal disaster costs.
3. In 2013, FEMA created the National Hazard Mitigation Framework. The degree to which the framework addresses the issues noted in this paper, other research, and the input of state and local officials merits close attention.
4. Each state maintains a federally-funded SHMO position that is responsible for the oversight and administration of state hazard mitigation planning and grants management activities as well as providing technical assistance to local governments.
5. Following federally-declared disasters, states are provided, as part of HMGP administrative costs, funding to manage the grant program. These funds may be used to hire staff and contractors, conduct training, rent office space, travel to relevant events such as conferences and workshops, purchase equipment, or conduct other activities pursuant to an administrative plan that is agreed to by FEMA.
6. In another study conducted by our research team, we found that that North Carolina's incentive-based approach resulted in higher quality local hazard mitigation plans when compared to Florida's more regulatory approach (Berke, Lyles and Smith 2011).
7. FEMA's Public Assistance (PA) program funds a number of post-disaster response and recovery efforts including state and local personnel costs associated with managing response and recovery programs, debris removal, and the repair of damaged infrastructure. The post-disaster application of the PA "406" program, which can be used to incorporate hazard mitigation measures into the repair or reconstruction of damaged infrastructure, varies significantly across states.

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Residential Household Knowledge and Receipt of Potassium Iodide Within the 10-Mile Emergency Planning Zone of a Nuclear Power Plant in North Carolina, 2010

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There has been renewed interest in radiological preparedness and countermeasures for nuclear power plant (NPP) emergencies in the United States as a result of the Fukushima Daiichi accident in March 2011. One such countermeasure, potassium iodide (KI), was voluntarily pre-distributed to households in a central North Carolina community living within the 10-mile Emergency Planning Zone (EPZ) of a NPP in 2010. The goal of this study was to evaluate household KI coverage among EPZ residents following this pre-distribution campaign, as well as to assess knowledge and beliefs about KI. A guided interview and self-administered questionnaire was administered to a random sample of 177 EPZ households. Findings indicate four months post-distribution that this program resulted in low household KI coverage rates (< 5%) and low KI knowledge levels. Results demonstrate the need for improved KI pre-distribution and education strategies targeting households within the designated 10-mile EPZ.

Keywords: Potassium iodide, radiological preparedness, emergency planning zone, community assessment, residential households.

Introduction

The March 2011 Japan earthquake, tsunami, and subsequent nuclear crisis at the Fukushima Daiichi plant has resulted in renewed interest in radiological preparedness countermeasures for nuclear power plant (NPP) emergencies in the United States. Following the Three Mile Island accident in 1979, the Nuclear Regulatory Commission (NRC) closely examined emergency planning measures to protect the public during an NPP emergency. Emergency actions recommended by the NRC include evacuation, sheltering, and the supplemental use of potassium iodide (KI) among populations living within a 10-mile radius of the NPP accident site (USNRC, 10 CFR 50.47(a) (1)). KI has been shown to lower the risk of thyroid cancer after radioactive iodine exposure especially among exposed children (National Research Council 2004; Verger et al. 2001).[1] Radioactive iodine (I-131) is one of several radioactive isotopes that may be released after an NPP emergency. Since the timing of the administration of KI is critical for its protective effect (prior to exposure), emergency officials in many communities have advocated for pre-event distribution ("pre-distribution") to households that are near a NPP. Indeed, the Nuclear Regulatory Commission (USNRC) began encouraging states, in 2001, to distribute KI to populations within a 10-mile radius of NPPs as a protective measure intended to supplement more important response activities, such as sheltering and evacuation, in the unlikely event of a severe NPP accident.

In the decade since the NRC rule became effective, states with NPPs have taken a variety of approaches to the distribution of KI within the 10-mile Emergency Planning Zone (EPZ). Although a few states predominantly rely upon post-incident distribution, most accompany their post-incident distribution plans with robust pre-distribution programs (National Research Council 2004). The states that choose to pre-distribute KI generally delegate responsibility for the pre-distribution program to state and local public health agencies that coordinate with other agencies in their jurisdictions to maximize KI pre-distribution. KI pre-distribution methods used by states vary and have included distribution by mail to EPZ households, one-time or rolling distribution at designated community sites and, rarely, door-to-door distribution (Blando et al. 2007a; Blando et al. 2007b; Carney et al. 2003; Fowinkle et al. 1983).

Pre-distribution methods have been used with varying levels of success. A review of KI pre-distribution campaigns demonstrated household KI coverage rates in the 10-mile EPZ ranging from 3% to 70% (National Research Council 2004), though most reported coverage rates were based on household receipt of KI and not whether it was retained in the household afterward. Few studies estimate actual KI household coverage rates through a household survey conducted months to years after a pre-distribution campaign. In one study, conducted in the United Kingdom, a 40% decrease in KI household coverage was found two years after distribution (Astbury et al. 1999).

In North Carolina, pre-distribution of KI is managed by the North Carolina Division of Public Health (NC DPH) and the eleven local health departments (LHDs) having populations in the 10-mile EPZ of the state's four NPPs. Local and state health officials coordinate the pre-distribution of KI and develop public education campaigns to assure proper usage of KI in the event of a nuclear emergency. The LHDs actively pre-distribute KI for stockpiling to schools, daycare facilities, businesses and other institutions within the 10-mile EPZ. The pre-distribution of KI to EPZ households, however, is conducted through a voluntary method that asks residents to obtain KI at distribution centers on one or two designated days. A pre-distribution initiative that took place at one North Carolina (NC) EPZ in May 2010 offered an opportunity to evaluate the short-term success of this household distribution method and the accompanying educational campaign.

In May 2010, KI tablets were made available at no charge to residents of four NC counties within the 10-mile EPZ on designated weekend days at distribution centers located at schools and fire departments. Informational literature on KI (e.g., fact sheets) that were developed by NC DPH and the LHD were provided to each EPZ resident that picked up KI tablets. Prior to the distribution days, each LHD issued a press release and advertised the location of the distribution centers in local newspapers and on their county government web sites. The tablets provided in May 2010 replaced tablets distributed to 10-mile EPZ residents in 2002 and 2003, which were beyond the expected shelf life of five years.2 While LHD pre-distribution of KI to large institutions (e.g., schools, childcare facilities and businesses) in the 10-mile EPZ took place concurrently with the household distribution, this supply was not distributed through the distribution centers and was not assessed in this study.

The goal of this study was to determine the KI pill household coverage rates for EPZ residents and assess their knowledge and beliefs related to KI use. The University of North Carolina Center for Public Health Preparedness (UNC CPHP) at the UNC Gillings School of Global Public Health partnered with NC DPH to conduct a household-level cross-sectional study four months after KI distribution.

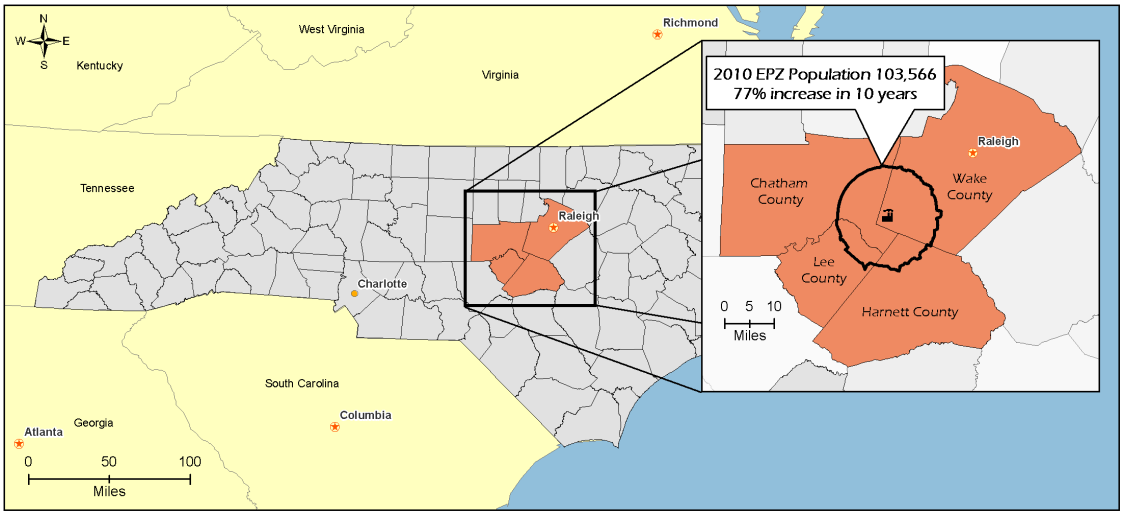
Methods

The EPZ study area is 330 square miles within four counties in central North Carolina (Figure 1). Based on the 2000 US Census, the population in the 10-mile EPZ was 58,524 persons. However, the EPZ has experienced a 77% increase in population over the last decade with the current population estimated at 103,566 persons (2010 US Census).

To assess KI coverage, a community population-based sample in the NC EPZ was selected using the 30 x 7 EPI cluster sampling method; 30 census blocks were randomly selected based on probability proportionate to population and seven households were randomly selected within each block for interviews (Malilay, Flanders, and Brogan 1996). This method was first developed in the 1960s as a tool for LHDs to conduct rapid

assessments of immunization coverage (Serfling and Sherman 1965). The sampling method was adopted by the World Health Organization's (WHO's) Expanded Program on Immunization (EPI) and later by the Centers for Disease Control and Prevention (CDC) for use in responses to natural disasters (Henderson and Sundaresan 1982; Malilay et al. 1996). This efficient sampling scheme has been validated and used effectively for rapid assessment and estimation of a variety of population-level public health needs (Frerichs and Shaheen 2001; Henderson and Sundaresan 1982). The 30 x 7 sampling approach was used in this survey to allow accurate estimates of KI pill coverage within the entire EPZ. The selection process was automated using a Geographic Information Systems (GIS)-based survey site selection toolkit developed by NC DPH in ESRI ArcMap 9 (Redlands, CA).

Figure 1. Map of the 10-Mile Emergency Planning Zone (EPZ) Study Site, North Carolina, 2010



The sampling frame included census blocks whose centroid (geometric center) lies within the 10-mile EPZ. Households that were outside the 10-mile EPZ were excluded from the study. Census blocks with fewer than 10 households were excluded from the sampling frame in order to ensure that an adequate number of respondents could be reached in each block. Only individuals 18 years old or older who resided in the household and provided oral informed consent were eligible for inclusion in the study.

Surveys were conducted between the hours of 10 a.m. and 6 p.m. on Friday, September 17 and 24 and Saturday, September 18, 2010, via in-person interviews with one adult member of each selected household. Two-person interview teams, including student volunteers from UNC Gillings School of Global Public Health's Team Epi-Aid program (MacDonald 2005), six UNC CPHP staff members, and one LHD representative received training on the use of the handheld computers for data collection and standardized data collection practices prior to deployment.

Prior to administration, survey materials were reviewed, piloted, and pre-tested by LHD officials, North Carolina regional public health preparedness team members, and members of a local-area task force (a preparedness committee composed of emergency management, law enforcement, public health and utility representatives). All survey materials were translated into Spanish for census blocks with large Hispanic populations (>25%) based on 2000 US Census data and Spanish-speaking team members were deployed to these census blocks. This research was reviewed and approved by the Institutional Review Board of the University of North Carolina at Chapel Hill Gillings School of Global Public Health (#10-1527).

The survey assessment tool had two parts: a guided interview with a total of 20 possible questions and a self-administered questionnaire with 14 questions. The data were collected electronically at the time the interview was conducted; responses were recorded on a handheld GPS unit by field team members. The questions were designed for three groups—households that received KI tablets during the May 2010 distribution, households that had received KI tablets prior to the May 2010 distribution, and households that had never received KI tablets. The guided interview portion of the survey incorporated skip patterns to facilitate interviewing these three groups. Other questions probed residents about their knowledge of the KI distribution in May 2010, as well as their sources of information about nuclear emergencies and preferred distribution methods for KI.

All respondents were asked to complete a self-administered questionnaire evaluating residential household knowledge of KI and indications for its use. Administered on a note card, the questionnaire consisted of five general knowledge questions (three true/false and two multiple choice) adapted from a previous community survey of KI knowledge (Blando et al. 2007). Additional multiple choice questions assessed behavioral intentions, including multiple-choice response about where someone might find KI and what they would initially do following a radiological event. Residents were also asked to rate their concern for a NPP accident as well as other local hazards on a 5-point Likert scale (1 = *no concern at all* to 5 = *very concerned*). Limited demographic data, including year of birth, race, education, household size, and length of residency were also collected. To check awareness of the 10-mile EPZ, residents were asked to confirm that they lived in the 10-Mile EPZ of an NPP, i.e. “do you live in the 10-mile EPZ,” along with a response option of “don’t know”. Note cards were perforated, allowing interviewers to take the completed survey and respondents to retain information about KI, the study and contact information for the local health department liaison to obtain KI. Data from the note cards were recorded by the interview team on the handheld unit immediately after the interview to minimize data loss.

Univariate and bivariate analyses were performed to identify associations between demographic and EPZ related effects, including length of residency, awareness of EPZ

residency, and receipt of KI. All statistical analyses were conducted in R (R Development Core Team 2010).

Results

A total of 475 households were visited in the population-based survey and contact was made with 240 eligible households (51%). Excluded or ineligible households included those who were not home or did not answer the door (n = 223) and those who either did not live in the residence or were under the age of 18 (n = 12). Of the 240 eligible households, individuals from 177 households consented to the survey yielding a response rate of 74% (177/240). Among the households excluded were those who refused to participate (n = 61) or where there was a language barrier (n = 2). In addition, 172 of the 177 households who were interviewed completed the self-administered questionnaire.

The demographic characteristics of the surveyed population were generally comparable to the demographic profile for this area as determined by the 2000 US Census (Table 1—Note: 2010 US Census demographic data was not available at the time of the study). However, the age of the study sample was older and the median household size was larger than would be expected based on 2000 US Census data. The median reported age of the study sample was 49, which ranged from 18 to 90 years. The racial composition of survey participants was similar to the distribution of 2000 Census data. More than half of the survey respondents reported they had a college degree. The median length of residency in the 10-mile EPZ for the study sample was eight years (range: 1-60 years).

KI Distribution and Education

In all, nine respondents (5.1%) reported that they or someone in their household had received KI tablets during the May 2010 distribution, with an additional 18 respondents (10.2%) reporting having received KI at a prior time (Figure 2). Approximately 95% of respondents (168/177) said they had not received or did not know if their household had received KI during the May 2010 distribution. Of these, approximately 85% (150/168) reported never having received KI. Among the 27 respondents that received KI in May 2010 or at another time, 17 indicated that they still were in possession of it in the household). This results in an actual KI household coverage rate of slightly less than 10% (17/177).

Table 1. Comparison of Demographics between the KI Survey and 2000 US Census Data

	KI Survey	2000 US Census
Gender		
Male	49.7 %	49.4%
Female	50.3 %	50.6%
Age[1]		
20-24 years old	2.3%	6.0%
25-34 years old	14.1%	23.4%
35-44 years old	16.9%	18.1%
45-54 years old	22.0%	10.9%
55-59 years old	9.6%	3.2%
60 years old and over	21.5%	11.7%
Race/ethnicity		
White	76.7 %	75.9%
Black/African American	14.0 %	15.2%
Hispanic	5.8 %	3.6%
Other[2]	3.5 %	3.9%
Household Size (median)	3.0	2.0

1. There were 21 respondents who did not report their age and 3 respondents (1.7%) under the age of 20.
2. "Other" category includes Asian (n = 1), American Indian (n = 1), Hawaiian (n = 1), and those who also reported "other" during the survey (n = 4).

When asked if they would obtain KI tablets, 40% (60/150) of the respondents who never received KI tablets indicated that they would obtain KI in the future. The most often cited reason for not obtaining KI tablets for themselves and their family was a low level of concern about a radioiodine release from the NPP. Additional reasons for not obtaining KI included an inconvenience to pick up, availability through a workplace or school stockpile, as well as safety concerns.

Each respondent was asked, "What do you think would be the best way for local health officials to distribute KI to you? Out of 177 households, 41% (n = 72) preferred KI tablets to be distributed in the mail, whereas 24% (*n* = 43) preferred the current distribution sites at schools or fire departments and 20% (*n* = 35) preferred to receive KI through a physician's office or local pharmacy (Figure 3). Approximately 10% (n = 19) of respondents also noted "other" methods of distribution, including door-to-door delivery and distribution at businesses and college campuses.

Additional questions were asked about expected individual response to a nuclear emergency. When asked what would be the first thing that they would do in the event of a nuclear accident at the nearby NPP, most residents (*n* = 151; 89%) indicated that they would evacuate or listen for emergency announcements. Residents were also asked about

locations where they thought they might be able to get KI, if there was an emergency. Of the 172 who responded to this "check all that apply question," 36% (*n* = 62) did not know where they might be able to get KI tablets, whereas 40% (n = 69) believed they would be able to get KI from their local health department. The remainder believed they could obtain KI tablets from a hospital emergency room (*n* = 40, 23%), a fire department (*n* = 33, 19%), or other locations, including the American Red Cross and shelters (*n* = 3, 2%).

Figure 2. Receipt and Retainment of KI Pills among Surveyed 10-mile EPZ Households (n = 177), North Carolina, 2010

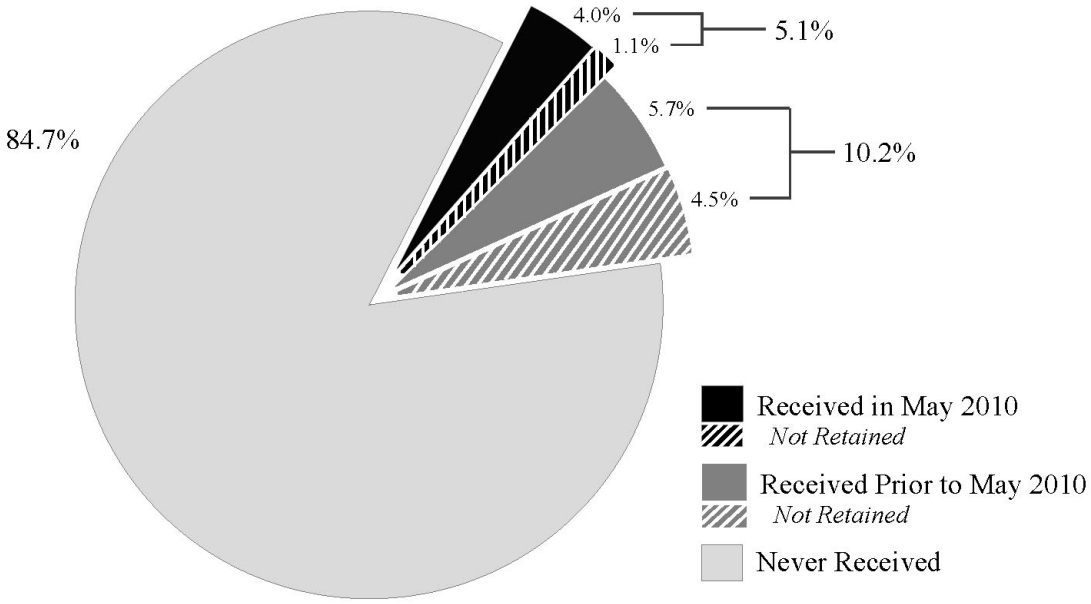
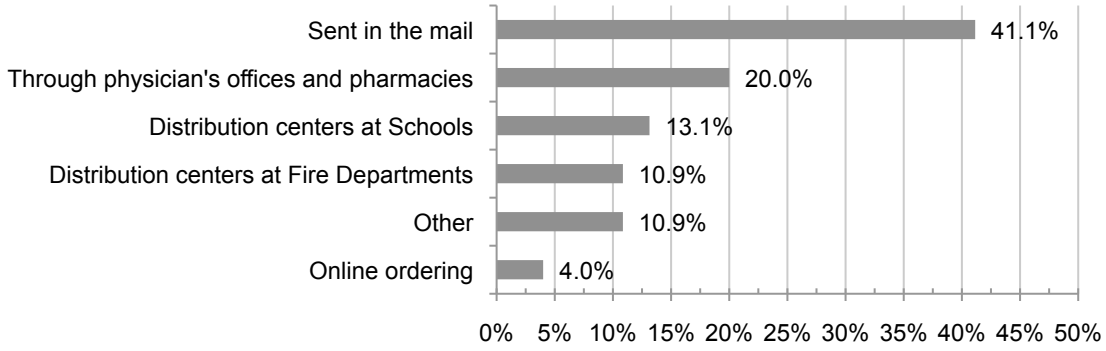


Figure 3. Preferred KI Distribution Method Reported by 10-mile EPZ Residents (n = 177), North Carolina, 2010



Four of 172 (2%) respondents were able to correctly answer all five KI knowledge-based questions. A majority of respondents replied "don't know" in their responses to these questions. In a comparison between those that had received KI tablets versus those who did not, those households who had obtained KI tablets performed significantly better on the knowledge assessment than those who had never received KI (Spearman's rho (ρ) = 0.19, $p < 0.05$). As indicated in Table 2, age (ρ = 0.17, $p < 0.05$) and length of residence (ρ = 0.172, $p < 0.05$) were found to be positively correlated with knowledge of potassium iodide, along with EPZ awareness (ρ = 0.23, $p < 0.01$). Gender and education were not significantly correlated with knowledge, but there were differences among racial and ethnic groups. The average knowledge of KI among White, non-Hispanic, respondents was found to be positively correlated (ρ = 0.20, $p < 0.01$), whereas knowledge among non-Hispanic African-American respondents was found to be negatively correlated (ρ = -0.17, $p < 0.05$). However, overall knowledge of KI among respondents was low—a mean response among non-Hispanic Whites of 1.75 (less than two of five questions correctly) and among non-Hispanic African-Americans of one of five.

Table 2. Correlations of Residents Potassium Iodide Knowledge to Demographic and EPZ Effects in North Carolina, 2010

Variables	Knowledge of Potassium Iodide
Demographics	
Age[+]	0.17*
Gender (Female)[✧]	-0.18
Education[+]	0.04
Race[✧]	
White	0.20**
African-American	-0.17*
Hispanic	0.02
Other	0.03
EPZ Effects	
Length of residence[+]	0.17*
EPZ Awareness[✧]	0.23**
Received KI[✧]	0.19*
n = 170	

Significance levels: * $p < 0.05$, ** $p < 0.01$

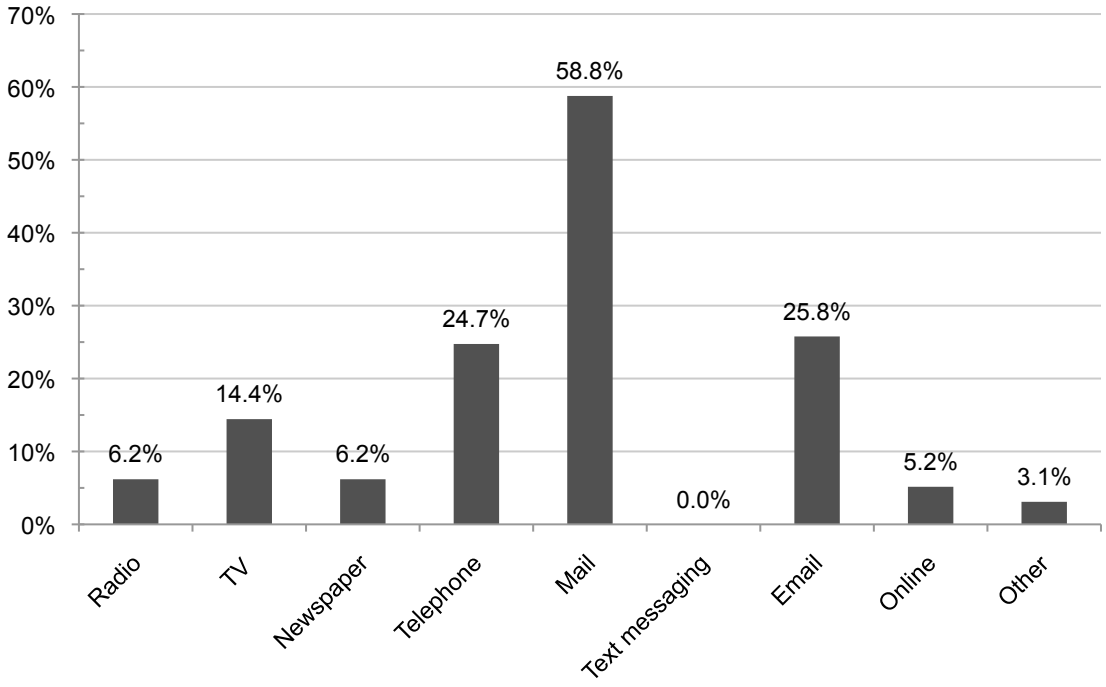
[+] Pearson's *r*; [✧] Spearman's Rho

Awareness, Communication, and Concern

With regard to the distribution in May 2010, 58% ($n = 97$) of respondents who had not received KI during the May 2010 distribution reported that they had not heard about the distribution opportunity. As a follow-up to this response, respondents were also asked about the best ways in which LHDs and other officials could distribute information about

KI to them. A majority of respondents (59%) prefer to receive information and communication about KI from LHDs through the mail, while others preferred email (26%), telephone (25%), television (14%), and other methods (21%), such as radio, newspaper, or text messaging (Figure 4).

Figure 4. Preferred Methods of Communication about KI Distribution Reported by EPZ Residents, North Carolina, 2010 (n = 97)*



** Total respondents are those EPZ residents who were unaware of the May 2010 KI distribution.*

Regardless of KI receipt, household representatives were also asked to identify all possible sources from which they received most of their information about nuclear emergencies and the use of KI. On average, respondents reported two different sources of information (range: 1-8 sources). The five primary sources included the power company that owns the NPP (33%), television (29%), mail (24%), online (21%), as well as "other" sources, including pamphlets, school handouts, and signage (19%).

Residents were asked how concerned they were about local hazards affecting them in the next five years, including flooding, NPP accident, ice storms, tornadoes, hurricanes, and terrorist attacks. Only 34 out of 159 (21%) respondents reported a high level of concern (4 or 5 on a scale of 1-5) for any of the hazards, whereas 90 (56%) expressed very little or no concern (1 or 2). Respondents were more concerned (4 or 5) about ice storms (35%) and hurricanes (34%), than they were about a NPP accident (22%) in their local environment. In fact, respondents rated NPP accidents as one of their lowest concerning hazards, rating it only above flooding. These low levels of concern for a NPP

accident were also reflected in a related question in which respondents asked whether they lived within ten miles of a NPP. Twenty six percent (44 of 170) were not sure whether they lived in the 10-mile EPZ and twelve residents (7%) reported they did not live in the 10-mile EPZ. Length of residency, however, was directly correlated to knowledge of EPZ residency ($\rho = 0.21$; $p < 0.01$) with newer residents less likely to confirm EPZ residency than residents who had lived in the EPZ for longer than the median (8 years).

Discussion

Our findings indicate that the voluntary KI pre-distribution program was associated with low household coverage rates in one North Carolina EPZ four months after distribution. Very few EPZ residents received KI during the May 2010 distribution and even fewer reported that they could locate their stockpile at the time of the survey (September 2010). While the large majority of residents in this EPZ reported they have never received KI, a significant number of residents interviewed indicated that they would obtain KI in the future, suggesting that there is a demand for KI that has not been met with the existing distribution method. Only a third of our respondents reported hearing about the May 2010 distribution opportunity. A change in marketing techniques and promotion of the designated dates and locations of KI distribution centers may increase household KI coverage rates. Targeted communication to 10-mile EPZ residents is likely to be more successful than broad messaging. For example, one respondent suggested that a way to improve awareness of designated KI distribution locations was to use automated notification systems (e.g., Reverse-9-1-1) to selectively alert 10-mile EPZ residents to KI distribution opportunities in their area.

Over 40% of EPZ residents expressed preferences for an alternative to the current distribution model, notably receipt of KI through the mail. While the distribution of KI through the mail has been used in some jurisdictions, it may not be feasible for most LHDs who receive no federal or state funding to offset the cost of their KI distribution activities. Pre-distribution of KI through the mail is associated with higher household coverage rates than the single distribution site method used in this case (National Research Council 2004), but there is little long-term data on whether KI is readily accessible at home in the years after initial distribution. Cost-effectiveness studies are needed to compare per household costs of providing KI through various KI pre-distribution methods (e.g., mail, community distribution) to offer LHDs practical guidance on how to increase KI coverage most efficiently.

Findings from the survey also suggest that a lack of demand for KI among EPZ residents may play a role in the observed low coverage rates. The knowledge assessment revealed that most EPZ residents did not have a basic understanding of KI and its use. EPZ residents are unlikely to demand countermeasures that are not well understood. Our

results suggest a need for improved communication and education about KI. Some EPZ residents rated an NPP accident as their lowest level concern as compared with meteorological hazards such as hurricanes, tornadoes and ice storms. These residents may not be interested in obtaining KI tablets through any distribution method employed by the LHD. Nevertheless, it is encouraging that most EPZ residents considered evacuation and listening to emergency announcements as their primary response actions after an NPP accident. Our survey did not investigate knowledge of evacuation plans and routes, but it is important to note that KI is a supplemental countermeasure to evacuation of the 10-mile EPZ in most NPP accident scenarios.

Nearly one-third of 10-mile EPZ residents did not know or were not sure whether they lived in the 10-mile radius of a NPP. This lack of basic knowledge among a significant minority of EPZ residents highlights the need for improved communication and education about the NPP's location and its implications for residents living nearby, as well as appropriate preparedness and response activities. Although a number of residents reported receiving information about the NPP in their mail, redundant means of notifying residents of EPZ residency should be considered. One possible explanation for the lack of understanding about nearby hazards in this EPZ is the explosive population growth seen in the area over the last decade. We found that residents who had lived in the EPZ for less than the median length of residency (8 years) scored lower on KI knowledge tests and were more likely to be unaware that they lived in the 10-mile EPZ. This suggests that preparedness initiatives targeting new residents to the community (e.g., public safety welcome kit) may be successful in maximizing impact among jurisdictions with limited funds. EPZ population growth is not unique to our study area; nationally there has been a 17% increase in EPZ residents over the past decade (2010 US Census). State and national policymakers may want to consider development of new policies or enforcement of existing ones such as mandatory disclosures about a home's distance from an NPP as part of rental or real estate transactions.

One strength of this study is the generalizability of the results to the entire four county EPZ area. The GIS-based survey site selection toolkit allowed for random selection of households in the second stage of sampling which ensured that selected households were independent and represented the totality of the households in the cluster (Lemeshow and Robinson 1985). Although the sample size of this study is relatively small, the two-stage cluster sampling methodology is designed to be representative of the source population and has been widely validated (Malilay, Flanders, and Brogan 1996). This study has several limitations. If those who are at highest risk for being missed by the KI distribution were also more likely to be missed in this survey, there is potential for response bias. To minimize this problem, interviews were conducted on weekends and weekdays; however, surveys were only conducted during daytime hours. A comparison of demographic variables collected through the sample with US Census data suggests minimal bias. More generally, this assessment was conducted among residential

households and does not assess the coverage rates among schools, daycare facilities, or large businesses (more than 100 employees) within the EPZ. One LHD in the EPZ used a "push" distribution method to deliver KI tablets to these non-residential EPZ locations which represents significantly more KI coverage than can be found in households.

Conclusions

Although EPZ residents expressed relatively low concerns about a NPP accident at the time of the survey (September 2010), the NPP crisis at the Fukushima Daiichi NPP in 2011 may have altered concerns and knowledge associated with KI and radiological preparedness at an international, national, and local level. A substantial increase in demand for KI in the western United States occurred after the Fukushima Daiichi accident despite the fact that harmful levels of radioactive iodine did not materialize outside Japan. Like similar fear-driven pharmaceutical runs (M'ikanatha et al. 2005), these spikes in demand generally result in the misallocation of scarce drugs to individuals that do not need them. The only individuals that the USNRC currently recommend receive and store KI as a prophylactic countermeasure are those who live or work within a 10-mile radius of an NPP. Our results show that most residents of a central North Carolina community living in the 10-mile EPZ of an NPP lack household access to KI and an understanding of its use. In light of renewed interest after the Japan NPP accident to broaden the pre-distribution of KI beyond the 10-mile EPZ parameters (Markey 2011 letter), future planners and policy makers should balance the benefits and barriers to successful pre-distribution in the 10-mile EPZ to help devise new strategies to increase KI coverage and education in accordance with other NPP preparedness and response activities.

Notes

1. According to the Food and Drug Administration (2001), the protective benefits of KI decrease with age with dosages adjusted according to age, exposure, pregnancy and/or lactation status. KI is recommended to pregnant women, lactating women, children, and adolescents to minimize the risks of abnormal thyroid function, including hypothyroidism and thyroid cancer. Benefits are minimal for those between the ages of 18 and 40, unless projected exposures are high (>10 cGy). With the exception of these groups, the benefits of KI for individuals over the age of 40 are negligible unless very high radiation doses (>500cGy exposure, approximately equivalent to 500,000 chest x-rays or coast-to-coast airline flights) are projected. For additional details and dosage breakdowns, see US FDA (2001).
2. The shelf life of KI tablets was extended to seven years by the Food and Drug Administration in 2004 (US DHHS 2004).

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Citizen Journalism as Data for Disaster Research

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The "story" of a disaster is no longer simply told by the traditional media. Along with developments in communication technology, we are witnessing the desire of active citizens, via acts of citizen journalism, to be involved in telling the story of a "disaster". Accordingly, from the perspective of disaster researchers seeking to understand how others perceive response to disaster, material created by citizen journalists provides a unique insight into the activities of members of the public following a disaster. The article begins by providing illustrations of acts of citizen journalism following acts of terrorism include the 2007 Glasgow airport attacks and the 2008 Mumbai attacks. The article then goes on to provide researchers with a methodological tool known as qualitative media analysis for the study of citizen journalism data. It will provide evidence of this methodology in action by presenting a case study of the 7th July 2005 London bombings.

Keywords: Citizen Journalism, disaster, sociology, response, communication.

News in contemporary society is no longer simply produced solely by those journalists working in the professional news media industry. In addition, there is an increasing presence of the public in the reporting process via acts of citizen journalism. Some academics have taken the important route of trying to understand what citizen journalism implies for disaster communication and first response (Novak and Vidoloff 2011). This article takes a different perspective of citizen journalism by showing how material created by citizen journalists can be accessed and analysed by researchers to assist them in understanding how citizens at the scene of a disaster perceive others to respond.

The aim of this article is threefold. First, it will provide a number of examples of citizen journalism activity following a terrorist attack to show what type of material citizen journalists are able to produce. Second, the article will use qualitative media analysis to interpret citizen journalism data. The article will discuss this methodological technique and illustrate its usefulness by supplying the reader with an analytical case

study of the 7/7 London attacks. The article will conclude by considering some of the important considerations for researchers when accessing and utilising data created by citizen journalists.

What is Citizen Journalism?

At its simplest level, citizen journalism involves the activity of members of the public, who lack professional journalism training, in the capture, production and distribution of news items. Within academia, citizen journalism has been discussed using several alternative terms, including participatory journalism (Bowman and Willis 2003; Nip 2006; Domingo et al. 2008; Paulussen and Ugille 2008), user generated content (Hermida and Thurman 2008) and citizen participation (Bakker and Paterson 2011). This article uses the term citizen journalism to refer to the involvement of the public in the collection, production and distribution of news items, as also referred to by a number of other scholars (Allan 2007; Allen and Thorsen 2009; Rosen 2008; Greer and McLaughlin 2010 and Lewis et al. 2010).

As argued elsewhere, citizen journalism can be broken down into two distinct forms: dependent and independent citizen journalism (Watson 2011). The primary distinction here is that dependent citizen journalism relies on existing professional news organisations for the distribution and publication of information, whereas independent citizen journalists utilise their own forms of communication for the self-publication of material. The following diagram seeks to show the difference between the two:

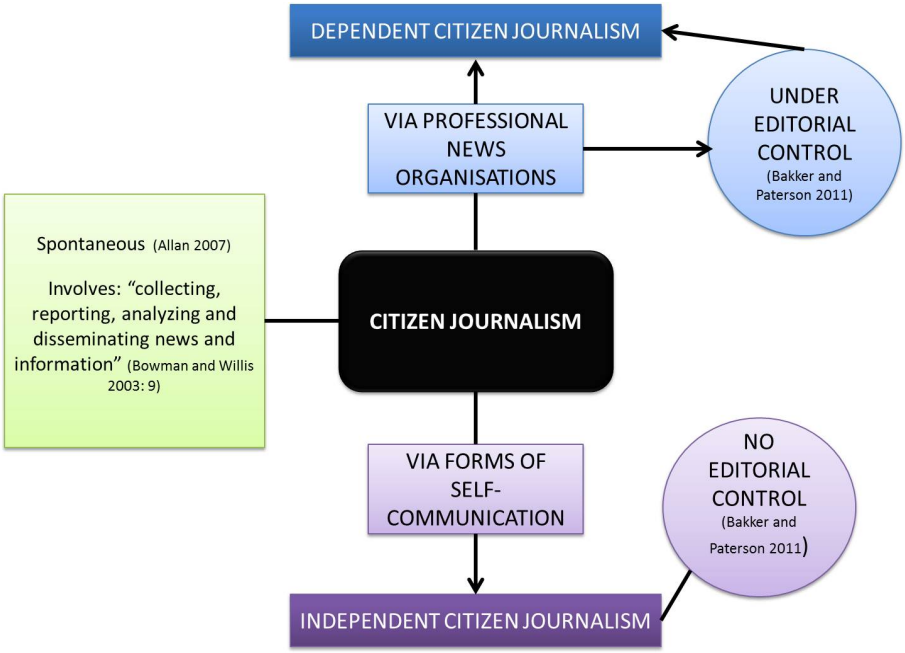
As seen in Figure 1, this article's understanding of what constitutes citizen journalism has been influenced by exposure to other studies (Allan 2007; Bowman and Willis 2003; Bakker and Paterson 2011). With such disagreements over the usage of the terms, it seems suitable to keep the term "citizen journalism" but to make a distinction between different forms of citizen journalism within the news production process—with editorial control at the forefront of this distinction. Due to their aspiration for publication within existing media organisations, dependent citizen journalists are under editorial control of the news provider they choose to submit their material to. Alternatively, independent citizen journalists are not under any official editorial control; rather it is at the discretion of the individual to edit his/her own material prior to self-publication via the web.

This article will focus on providing examples of dependent citizen journalism to show how they are both useful in understanding how citizen journalists perceive that others respond to a disaster and how ordinary members of the public turn to technology to communicate their experiences following a disaster. Focus will predominantly be placed on the 7/7 attacks which, although dated, are important to the emergence of citizen journalism in the wake of a terror attack. The 7/7 attacks marked a point in time when the news media noticed and commented upon the importance of the contributions from

members of the public to help present the news. The BBC's director of news Helen Boaden (2008) wrote:

> [F]or newsgathering, what happened on 7 July three years ago marked a watershed: the point at which the BBC knew that newsgathering had changed forever…Within 24 hours, the BBC had received 1,000 stills and videos, 3,000 texts and 20,000 e-mails. What an incredible resource. Twenty-four hour television was sustained as never before by contributions from the audience...At the BBC, we knew then that we had to change. We would need to review our ability to ingest this kind of material and our editorial policies to take account of these new forms of output.

Figure 1: Forms of Citizen Journalism



Citizen Journalism and the Public Response to Disaster

Sociologists interested in the study of disasters have identified a tendency for narratives to be centred on the promotion of disaster myths. Disaster mythology as a concept suggests that following a disaster, the everyday norms by which people live their lives will collapse and be replaced by irrational and unpredictable behaviour. Typical characteristics of this understanding of public reaction include people fleeing in panic, being psychologically dependent, suffering from shock and therefore unable to act independently, acting selfishly, and taking part in looting (Alexander 2003; Almedom

2008; Fischer 2002; Glass et al. 2002; Jacob et al. 2008; Jones et al. 2006; Leitmann 2007; Quarantelli 1954; Wessely 2005; Stock 2007).

As Perry and Lindell (2003, p.49) argue, those affected are often referred to as being socially disorganised as well as being personally disorientated. In a recent assessment of common myths discussed in the wake of a disaster, Jacob et al. (2008, p. 562/563) assessed the distinction between myth and reality following Hurricane Katrina in 2005:

> Regarding the issue of psychosocial responses to disaster, it was believed and hyped in the media that massive trauma led to the abandonment of social mores and relationships and even to violence, as people attempted to escape or to satisfy their own individual needs (Myth #4). To the contrary, studies of behaviour in disaster show that the great majority of those directly affected tend to remain calm and behave in an orderly and considerate fashion... Contrary to the view that affected populations respond with shock, helplessness, and overall passivity (Myth #5), the tendency toward social affiliation also leads to a multicultural dedication to the common good, expressed in altruism, camaraderie, and social solidarity among victims, enabling many to find new strength and resiliency during the emergency and to respond positively and generously.

As seen in the extract above, Jacob et al. (2008) found that the media generally exaggerate what are known as mythical responses to disaster; emphasis is placed on poor community relations and individuation, but in reality individuals respond in a calm and orderly manner. Individuals can be resilient and find new strength when faced with adversity. Accordingly, if perceptions of how the public reacts to terrorist incidents are shaped by inaccurate disaster myths, this could have negative effects on how the public regard the threat of terrorism, and may hinder their capacity to respond to future attacks.

Elsewhere Furedi (2007) argues that the public react in one of two ways following a disaster: with resilience or vulnerability. He develops two paradigms to aid understanding of the difference between a resilient and a vulnerable response to terror. When regarding a vulnerability paradigm, focus is placed on the individual rather than the community, and it is believed that the individual/community is unable to cope with an attack. In comparison, under a resilience paradigm, there is an "orientation towards the community" and the faith in the ability of the community to cope (Furedi 2007, p. 4).

Following 7/7, citizen journalists generally seem to point towards a more resilient interpretation of response to the attacks. This is supported by a number of studies that have since directly assessed the response of those caught up in the attacks. Sheppard et al. (2006, p. 235) found that while the media reported of widespread panic following the 7/7 attacks, in fact there was cohesion, unity, and mutual co-operation. A study by Rubin et al. (2005) found that, following a telephone survey of 1,010 Londoners 11-13 days after

the attacks, one third of the sample reported symptoms of stress as a result of the attacks. Nonetheless, when asked whether or not the attacks had impacted their planned future travel arrangements, only 30% stated that they planned to use public transport less. Following the study, further information from the underground rail network in London suggested that use of the underground had "returned to expected levels within three months" (Sheppard et al. 2006, p. 235).

Alternatively, by using the method of triangulation, through the analysis of newspapers, archival personal accounts and primary data collection, Drury et al. (2009, p. 84) found that despite the widespread reports of panic following the London bombings, their analysis suggests otherwise:

> In describing the London bombings of July 2005, the term "panic" was used by a number of witnesses and survivors—and, indeed, more so by commentators who did not witness events directly. Yet the concrete and detailed descriptions of survivors' behaviours tell the opposite story. Rather than personal selfishness and competition prevailing, mutual helping and concern was predominant amongst survivors, despite the fact that most people were amongst strangers rather than affiliates. There is also evidence that this helping behavior took place in spite of perceived danger rather than because people felt that they were now out of danger. (Drury et al. 2009, p. 84)

Drury et al. (2009, p. 85) found that there was predominantly a sense of resilience in the form of solidarity, rather than an individualised, vulnerability-led response. Importantly, some of the archival personal data that Drury et al. (2009, p. 72) used for part of their analysis were blogs and other accounts submitted to news media sources such as the BBC.

As supported in a study of citizen journalist material submitted to the BBC following the London bombings, individuals sharing how members of the public are perceived to respond to an act of terrorism can counter the aims of terrorism by dispelling the myth of a panic prone public and presenting a resilient response to terrorism (Watson, 2012). Other examples of citizen journalism following a disaster can be found after more recent acts of terrorism that reveal both positive and negative consequences of the increasing emergence of citizen journalism. One such incident is the attempted suicide car bomb at Glasgow Airport in 2007. The Glasgow airport attack took place at 15:15 when a Jeep Cherokee drove into the front doors of the airport, trapping itself in the automatic doors. After numerous attempts to get the car to move farther into the building, two would-be suicide bombers tried to flee the scene but were quickly tackled by police officers who were assisted by members of the public (BBC 2007; BBC 2010). From the perspective of

citizen journalists, once again members of the public had the tools at their disposal to record unfolding events (Boaden, 2008).

Videos uploaded to YouTube by traditional news media organisations reporting the Glasgow attacks reveal that they relied on contributions from citizen journalists to help them in the visual presentation of the news. The video of the BBC's report of the attacks was three minutes and forty seconds long, and had, by 19 February 2011, been viewed 26,077 times—showing that the material was indeed receiving an audience. The video includes an interview with an eyewitness, John Smeaton, who assisted the police in tackling one of the men responsible for the attack. Alongside video footage of the Smeaton interview is a series of photographs of the attacks. The YouTube content reveals two instances of citizen journalism, the first of which comprises images taken by members of the public at the scene of the attacks and utilised by the BBC in its report. The second instance is the act of recording BBC footage and sharing it with others on the video sharing website YouTube (Dstpfw 2007). From the perspective of researching citizen journalism material, researchers are able to access a range of data in the form of text, photographs and video footage.

The Glasgow attacks were reported to be part of a larger scheme by individuals associated with Al Qaeda, who had failed to set off other car bombs in London on the previous day (BBC 2007). Hermida's (2007) discussion of the presence of citizen journalism following the Glasgow attacks in the UK also notes that the BBC was inundated with footage of the attacks, with over 70 images and videos sent in by members of the public. Hermida (2007) argues that it is "the public, rather than professional journalists" who are "increasingly recording the first draft of history".

In contrast to the 7/7 attacks and the Glasgow airport attack discussed here, the 2008 Mumbai attacks saw the media confronted with the dangers of relying on the public for information. On the 26th November 2008, Mumbai became the victim of multiple terror attacks, the worst it had ever experienced. A series of attacks perpetrated by Muslim terrorists from Pakistan occurred within minutes of each other. In the first attack, gunmen targeted the Chhatrapati Shivaji railway station; in the second, gunmen opened fire on a popular café (Café Leopold). In the third attack, gunmen seized Nariman House, a business complex housing a Jewish outreach centre, and the fourth attack targeted Cama and Albless hospital for women and children. Finally, the fifth and sixth attacks involved the seizure of two luxury hotels, Oberoi-Trident and the Taj Mahal Palace. During these attacks, gunfire was widely reported throughout the city (BBC 2008). The attacks resulted in 165 fatalities and approximately 304 injuries (Indian Ministry of External Affairs Dossier 2009).

The Mumbai attacks were also accompanied by eyewitness statements to media organisations such as the BBC, where those directly affected by the attacks contributed to the reporting. In the quote below, Farhang Farzad Jehani spoke of incidents in the café that he owned, in which terrorists killed some of his customers and employees. In this

instance, a member of the public involved in a terror attack is able to offer a sense of reality by telling his/her story to the news media. In his account, Jehani provides context through rich descriptions of sounds and imagery, and presents claims about the continuing movements of the terrorists:

> On the night of the attack, I was watching the cricket match between India and England on TV in the bar upstairs with my brother...I suddenly heard a big blast. It sounded like a grenade. I peered down and spotted two young boys standing outside the cafe with automatic weapons who were firing indiscriminately…The firing continued for some four to five minutes. I crouched on the floor upstairs…After that, the guns stopped. Then the two men continued walking down a by-lane, firing from their guns. They were on the way to the Taj hotel. By the time I came down to the cafe, two of my employees and six customers, including three foreigners, lay dead on the floor. (BBC 2008)

Following the attacks, the BBC was criticised for its heavy reliance on the social networking website Twitter as a tool for information, raising questions about the amount of trust and reliability we can place on citizen journalist-based information. In responding to the criticisms, one of the BBC's editors Steve Hermann (2008) argued that the BBC did indeed monitor the micro-blogging service. He argued that the BBC was forced to make quick judgements in selecting what they thought was relevant and informative information. For Hermann (2008), messages from Twitter did not supply a great deal of information about the events, but did "give a strong sense of what people connected in some way with the story were thinking and seeing. In concluding his report on the BBC's actions during the Mumbai attacks, Hermann (2008) argued that the BBC, like other news organizations, were still learning how to deal with new forms of information during events and that an active audience is required to analyse and interpret the information.

Although citizen journalist material submitted to the news media was present during the Mumbai attacks, the attacks were most notable for the contribution of citizen journalists in a more independent form, with the publication of material via blogs and social networking sites such as Twitter rather than the news media (Gauravonomics 2008; Beaumont 2008). As Stelter and Cohen (2008) reported for the New York Times: "at the peak of the violence more than one message per second with the word 'Mumbai' in it was being posted onto Twitter". Twitter was not only a popular platform for citizen journalism; for some, it was a means of staying up to date with unfolding events (Stelter and Cohen 2008). Indeed, some believed independent citizen journalism during the 2008 Mumbai attacks upstaged the efforts of professional journalists (Moses 2008). When an attack takes place in the public eye, the future of reporting is not simply left to the work of professionals; amateurs can also play a crucial role in the production of information

and photography surrounding an event. This has similarly been identified by a series of studies investigating citizen journalism following a crisis (see the volume edited by Allan and Thorsen 2009).

What we are witnessing is the increasing activity of individuals involved in reporting a disaster. This presents researchers with a wealth of information for analytical purposes, as seen by the work of Drury et al. (2009). Elsewhere, there is evidence to suggest that researchers are accessing citizen journalist-based material to help them assess how the public responded to the attacks (additional studies include Novak and Vidoloff 2011 and Vultee and Vultee 2011). The existence of these studies support this articles view that sociologists engaged in the study of disaster responses should engage with news material created by members of the public – citizen journalists – in the aftermath of a disaster.

Assessing citizen journalism in the wake of a disaster offers social scientists the opportunity to assess data that was created during a crisis. This information ought not to be used in isolation, but can be used alongside other forms of research to assist a more comprehensive understanding of how the public responds to disaster. To show how citizen journalism material can be seen as useful, this article will next provide evidence of forms of dependent citizen journalism that tell us how dependent citizen journalists perceived others to have responded 7/7. The next section will describe the procedures used to analyze the data produced by citizen journalists.

Methodology

The emergence of citizen journalism data for research purposes is all well and good; yet, researchers must consider the methodological tools at their disposal for analysis. One such tool for analyzing material created by citizen journalists is qualitative media analysis (QMA). This methodological tool, developed by Altheide (1996), can also be utilised in the analysis of material created by dependent citizen journalists.

QMA involves the reflexive study of documents, which is a necessary aspect of sociological research as it allows the researcher to approach the study of culture. This method is also referred to as qualitative document analysis, ethnographic content analysis and qualitative content analysis (Bryman, 2008). The method is widely accepted across the social sciences and has been included in the *Sage Encyclopaedia of Social Science Research Methods* as described by Altheide (2004: 325):

> Ethnographic content analysis (ECA) refers to an integrated method, procedure, and technique for locating, identifying, retrieving, and analysing documents for their relevance, significance and meaning...A document is defined as any symbolic representation and meaning that can be recorded and/or retrieved for analysis.

As elaborated by Bryman (2008) these methodologies emphasise the role of the researcher in understanding the construction of meaning within documents. This may for some be referred to as an ethnographic practice under the principle that performing ethnography involves researchers spending a significant amount of time observing a particular social setting (Bryman 2008). Although contentious, Altheide et al. (2008, p. 134) defends the method as being ethnographic by stating that qualitative document analysis "involves immersion, exploration, contextual understanding and emergent insights into social meanings, relationships and activities".

QMA is an exploratory research method that immerses the researcher in a process of discovery in the study of documents via observation (Altheide et al. 2001, p. 306). This immersion of the researcher into documents allows for the gradual development of a protocol for studying documents in an in-depth fashion. It allows the researcher to interact with the material that he or she is viewing and to understand its content by placing it into its appropriate context. Understanding the context of a given situation is essential as it enables the greater understanding of the way in which individuals come to define a situation, in this case the London bombings.

In this analysis of dependent citizen journalism, data were gathered from *BBC News – Special Reports of the London Bombings*. The BBC was chosen as the site from which citizen journalism content would be analysed for three main reasons. First, during an investigation of the presence of citizen journalists during the London bombings, the BBC was the most prominent news source that actively noted the importance of members of the public in the news-gathering process (Boaden 2008). Second, the amount and range of material submitted to the BBC during the attacks made it a useful news organisation to study in relation to its interaction with the public in the news production process. In their annual report, the BBC reported that on the day of the attacks, they received "about a thousand images and clips emailed in by members of the public (BBC Annual Report and Accounts 2005/2006, 2006, p. 48). Not only did the BBC receive a vast amount of material, but it attracted a vast audience—receiving over 116 million page impressions (that is requests to open a web page) on the day of the attacks (BBC Annual Reports 2005/2006, 2006, p. 45). Finally, the data submitted to the BBC for publication were accessible for research purposes.

Prior to performing QMA on material submitted to the BBC by dependent citizen journalists, it was necessary to assess the range of material produced by members of the public that were found on the BBC's Special Report page for the London Bombings. Material included the presence of photographs, video footage, eyewitness statements and a survivor's diary. This material was analysed and the results were written up prior to conducting QMA of comments submitted to the BBC by members of the public.

The data used for QMA of citizen journalism content within the media were also from the BBC website in the form of comments that were submitted to BBC's *Your Accounts* pages. It is necessary to point out that the sample used was from comments that were

chosen by the BBC for publication—176 comments in total. The BBC has established editorial guidelines to ensure that comments uphold their established values and standards—trust, truth and accuracy, impartiality, editorial integrity and independence, harm and offence, serving the public interest, fairness, privacy, children, transparency and accountability (BBC Editorial Values 2011). The BBC moderates the content published on its website in three forms—pre-moderation, post-moderation, and reactive moderation (BBC Editorial Guidelines 2011). Pre-moderation refers to material submitted to the BBC requiring editorial moderation to determine whether it is suitable for viewing prior to its publication on the BBC website. Post-moderation includes material that is automatically published on the BBC website, but then may be removed if the editor feels that the material is unsuitable. Lastly, reactive moderation enables the BBC audience to highlight concerning material to BBC editors, which will then be inspected.

The comments were not solely written by those residing in London, but were submitted by individuals from across the world. For analytical purposes, the 176 comments were filtered, so as to only include comments that had been written by people in London. The reasoning for this filtering process was a desire to understand what those in and around London on the day of the attacks had to say. Each comment was copied and pasted into NVivo 8 for storage, after which the first 50 comments were examined to identify a protocol with which the content of comments could be analysed. By concentrating on 50 of the comments in the examination stage of the research, 13 variables were identified as being central to the textual analysis of the research: description, resilience, thanks and praise to emergency services and London transport staff, panic, no panic, chaos, calm, frightened, wanted to help, thoughts to victims, young (under 18), media-related comment, speculation and rumour. In order to code the data according to the protocol established above, each category was created as a free node. If a comment was relevant to the variable it would be classified according to the relevant code. At this stage, it was then possible to proceed with the analysis of the data according to the protocol. The section that follows presents a sample of results taken from the analysis to show how dependent citizen journalists' material can be used to provide researchers with an insight into how others perceive and respond to a terror attack.

7/7 and Dependent Citizen Journalism

The UK's capital, London, fell victim to several acts of terror on the 7th July 2005. At 08:50 British Summer Time (BST) of 7th July 2005, the city of London was attacked by suicide bombers. The London transport system was targeted by four British Muslims—Mohammed Sidique Khan, Hasib Hussain, Shehzad Tanweer and Germaine Lindsay. The first terrorist attacks occurred on the London Underground (subway system) on the Circle line between Aldgate and Liverpool Street. The second occurred at Edgware

Road Station and the third on the Piccadilly line between Russell Square and King's Cross. The fourth attack occurred an hour later targeting a London double-decker bus service at Tavistock Place. These attacks on the London transport network caused 52 fatalities and 770 injuries (BBC 2005a). Immediately following the attacks, broadcasts of "breaking news" were seen on news websites and television stations. Crucially, information about the attacks began to appear online from members of the public both directly and indirectly affected by in the attacks. Emphasis will be placed here on three forms of dependent citizen journalism—a survivor's diary, *Your Accounts* (reports submitted to the BBC by members of the public), and photographs (also submitted to the BBC by members of the public).

Survivor's Diary

Following an independent act of citizen journalism, in which the author wrote and self-published a blog post on London forum *Urban 75*, North (2007) was approached by the BBC to write a seven-day electronic *Survivor's Diary*. This became an on-going piece of dependent citizen journalism that would be published on the BBC website. *Survivor's Diary* presents evidence of the news media approaching individuals for content; in this case, the BBC approached North and invited her to share her experience with others. This indicates that interaction and communication between the news media and the public can be horizontal, with the news media approaching the public for information, as well as the public approaching the news media to publish their information.

The diary begins on the 7th July 2005 and includes an account of North's (2005) experiences during the London bombings – providing researchers with documentation for analysis:

> Even more people got on at Kings Cross. It felt like the most crowded train ever. Then, as we left Kings Cross, at about 8.55am, there was an almighty bang...It was so dark that nobody could see anything...I thought I was about to die, or was dead. I was choking from the smoke and felt like I was drowning... Air started to flood in through the smashed glass and the emergency lighting helped us see a bit. We were OK.

North then proceeded to post an account of her daily life, again including a range of comments concerning her emotions and her interactions with other people.

> SATURDAY 9 JULY 2005 1031 BST: Yesterday was a weird day. I felt sick all day, which I think was the smoke inhalation and the news overload. Friends called and texted and several beautiful bunches of flowers arrived. I love flowers. (BBC 2005d)

For BBC audiences, this personal account developed an understanding of the short-term responses of an individual caught up in a terrorist attack. The *Survivor's Diary* can be seen as an extension of first-hand citizen journalism to a comprehensive account of the seven days following the attacks, involving an individual's reflection. For the author, agreeing to write for BBC functioned as a form of healing; she reported "the words flowed out of me...writing for myself became a lifeline, writing for others a comfort" (North 2007, p. 113-114). Although subjective, North (2007, p. 113-114) can be seen as viewing her act of citizen journalism as a comfort both to herself and to others.

> Writing was a way of releasing the demons, the madness and despair that can bend the shocked brain out of shape and fracture the sense of safety and self after too-close horror. When I was writing I did not feel alone; though the audience was faceless, intangible, nonetheless I could feel a connection with those compassionate strangers. Through that hopeful pull of other people's presence, further along the path ahead towards the light of normality, encouragement sensed and read in other people's written responses, I could feel it and find it: a way out of the tunnel.

From the perspective of disaster researchers, not only can dependent citizen journalism such as a survivor's diary provide an insight into individuals' immediate perceptions of response around them, but material created by dependent citizen journalists can also go some way towards aiding understanding of an individual's response in the subsequent aftermath of a disaster (although not necessarily long-term).

Your Accounts

The analysis of *Your Accounts* consisted of a QMA of 176 comments that were submitted to the BBC and subsequently published. These comments were written by those members of the public in the UK only; comments from people abroad were excluded so as to focus on British response only.

Some accounts of the 7/7 attacks include general descriptions of events, which can be seen to range from being extremely descriptive to being relatively short; some pay particular attention to detail, while others supply very little information. This shows the variation in the level of detail supplied by members of the public. The construction of news by members of the public through *Your Comments* is not restricted to specific lengths or levels of detail; in supplying their own personal accounts, members of the public are given the opportunity to say as much or as little as they desire. Examples include the following accounts (BBC 2005b).

> *Short and Specific:* I was getting of the west bound central line at Liverpool street station at about 8.50. Halfway up the escalator, I felt the stairs shake a little and then there was a cloud of smoke that shot up from underneath the stairs. The alarm went off and people went crazy and just run out of the station.
>
> *Long and Descriptive:* I was stuck on the Piccadilly train behind the one that exploded for over two hours in a very cramped, hot carriage and I wanted to highly praise the driver for how calm, assuring and often amusing he was. He kept in communication with us, letting know what was going on (power cut to whole system), and what was happening next. His best quote was when he had tried to evacuate us all onto the train behind, but, because we were in the first carriage, by the time we had got close to the other train, it was too full to get us on. He said something like: "I don't know how you do it every day, but you all managed to squeeze yourselves onto that [first] train. But I can't now get you all onto the other train. I've tried, but there are pregnant women in there. So you lot are going to have to wait, we'll take the other train back to Arsenal and then we'll come back for you. You'll be on your own, but we'll be back soon." (not exact words) They left us there, and then the power came on, together with the air con - he advised us to close all the doors and vents to take advantage of the air con [air conditioner]. After a bit, our train started reversing and we were able to get off onto the station through the driver's door. I don't know if you can forward my thanks to this driver. His voice is heard on the amateur mobile video titled "Passenger praises tube driver's calm", from about 1:05 seconds into the footage.

Not only do descriptions of events provide researchers with information about how witnesses perceive events to unfold around them, but with regards to the sociological study of response to disaster, accounts submitted to the news media by dependent citizen journalists can provide evidence of how witnesses perceive others to respond. For example, in some comments, there appears to be evidence of individual's witnessing resilience amongst Londoners (BBC 2005b):

> I'm quite amazed by the resilience of Londoners. We were let out of the office early and I had made up my mind to get home walking if I had to, I was not going to take the bus after seeing photos of the blown up double decker. I was surprised seeing so many fearless Londoners jumping on buses as if nothing happened! Amazing spirit.

> Thank you to the kind lady in her MPV running a free shuttle service between Marble Arch and Shepherd's Bush last night. No fuss, no nonsense – just a sense of humour and the Dunkirk Spirit. Made me proud of my city and proud of my country. It'll take more than this to break the Brits

Elsewhere, comments submitted to the BBC by dependent citizen journalists can provide an insight as to whether or not panic occurred. As discussed in the previous section, following a disaster, there is often discussion that seeks to understand whether the public responded with panic. Quarantelli (1954) defines the term panic by placing emphasis on fear and a loss of self-control—"An acute fear reaction marked by a loss of self-control which is followed by non-social and non-rational flight behaviour" (Quarantelli 1954, p. 272). An individual experiences panic, according to Quarantelli, first as an emotional response and second as a physical response. The presence/absence of panic within the public response to disaster is an essential area of research, as it goes a long way to offering advice as to how members of the public are able to cope with and respond to adversity. In the case of the 7/7 attacks, citizen journalism can help to illustrate how members of the public perceived others to have responded to the attacks.

In total, the QMA found only eight comments out of 176 (4.5%) that stated that panic had occurred. One individual described their experience on the day of the London bombings as complete panic but, as can be seen in the quote below, there is no contextual evidence to support the statement. This forces us to question whether panic did actually take place.

> Was coming out of Liverpool Street when the first bomb went off then was down towards Aldgate when the second did. The worst day of my working life, complete panic, but we must all stand tall and not let these people win ever. (Comment 5)

A second comment describing panic is:

> I was on the Piccadilly Line-the first after there was a fire alarm at Caledonian Road. Just after Kings X there was a "bang" coming from the front carriage-the light went out and emergency lighting came on-smoke came apparently from outside-There were no announcement-some people started panicking after a while and tried to smash the doors-but only to injure themselves- after about 30min 2 policemen opened the back door and let people out...They should have passed information that there is no fire etc. the atmosphere in a packed tube carriage is already frightening enough. (Comment 128)

In contrast to comment 5, comment 128 supplies some contextual evidence to support the claim that panic was present, with people smashing the doors of a train carriage and in danger of injuring themselves. Returning to Quarantelli's (1954) definition of panic discussed above, evidence from the comment suggests that its author is describing the physical aspect of panic. Overall the author supplies a broad description of events allowing for an understanding of the type of situation that may be classified as panic – showing how important further context is to be able to infer what is meant by the terms used.

Although analysis of the comments suggests that some people did respond with a sense of panic, there was also evidence to suggest that there was no panic. For researchers interested in the public's perceived response, it is important to identify both circumstances, and to understand the full context of a situation, otherwise, public response may be misinterpreted. This places precedence on what an individual implies by the term they choose to use; how they construct an account is of utmost importance. For some, as discussed above, the term panic may imply mass hysteria, whereas for others it is seen as a flight to safety. The term panic thus does not necessarily imply a negative emotion and/or response. When categorising comments, five instances of no panic were identified, two examples of which are given below.

> I missed the Kings Cross explosion by 10 minutes and was evacuated from Moorgate station. I need to send heartfelt thanks to the emergency services, LU staff and fellow commuters. Not once was there any panic and the calmness and determination of everyone to get on with their day made me so proud. (Comment 2)

> I was on the tube from Highbury and Islington on the Victoria line at about 9.05am…En route, the driver made a second announcement that he had received the wrong message and that the train would not stop at KC St Pancras after all… As I walked from the station I overheard a walkie-talkie message that said something about "evacuating" the station. Outside of the station, most people we were on mobile phones to tell their workplaces they would be late, others were checking maps for bus routes. There definitely didn't seem to be any panic, but as I walked down Oxford Street (about 9.40am) there were so many sirens that people began asking others what had happened. There was definitely a sense of uneasiness that set in. (Comment 152)

Both of these comments give broad descriptions of events, allowing for an interpretation of whether the identification of an absence of panic is appropriate given the

wider context of the usage of the terms. Comment 2 emphasizes not only the lack of panic, but also the calmness and determination of individuals to get on with things. Comment 152 also emphasizes there not being any panic. Instead, the author describes a sense of unease that set in with the extensive presence of the emergency services, causing people to question what had happened. From the perspective of those analysing material created by members of the pubic, it is essential not to rely on these comments as presenting facts. They are simply interpretations of events, which in themselves are of interest to researchers interested in understanding how the public construe a situation.

Not only can dependent citizen journalism provide evidence of perceived response to a disaster, but further still, dependent citizen journalism can be seen as a way that some make sense of a situation. For instance, some comments provide evidence of individuals reflecting on the day's events, assisting them with making sense of a situation and, indeed, the consequences of an incident and further reflection of the necessary societal response to overcome the incident.

> I have been in the City of London close by the sites of today's outrages. I would just like to praise the calmness and common sense of Londoners who have acted calmly and with unflappable good humour in the face of the callous cruelty of these attacks. If only the perpetrators of these attacks could have seen the deep resilience of the Londoners I've been with today they might find themselves doubting the effectiveness of their vicious small minded philosophy of life. (Comment 79)

> There are 6 million people in the capital, most of whom get up and get on a bus or tube and do a journey twice a day. The bombers managed to kill only 37 of us, so it's going to take them a long time to really make any impact on Londoners. We will not be intimidated by anyone - no matter who they are or claim to represent! (Comment 334)

Elsewhere, there is also evidence of individuals wanting to be of use during a disaster—perhaps an additional way of individuals being able to cope with a situation that is in many ways beyond their control.

> It would be very helpful for me to know if BBC can inform us the way to do blood donation in a most appropriate way, if it is necessarily. I think that is only thing I can do at the moment for people who injured. (Comment 85)

In both instances, dependent citizen journalism, provides researchers with insight into disaster response that, although biased, may then encourage them to further investigate

the usefulness of dependent citizen journalism, not only in meaning making, but also, in being able to assist in the response to a disaster. This is of particular interest to future studies that seek to understand the role of social media and citizen journalism in assisting first responders to manage a disaster and engage the public in the disaster response.

Photographs

Following the events of 7/7, vast quantities of photographs and videos were uploaded to the Internet and submitted to the news media for publication. In their annual report, the BBC reported that on the day of the attacks, they received "about a thousand images and clips emailed in by members of the public (BBC Annual Report and Accounts 2005/2006, 2006b, p. 48). Of this material, the BBC published 16 images in the section *London Explosions: Your Photos*, ranging from photographs taken by those walking up underground tunnels to photographic evidence of the bomb blasts—providing evidence of the BBC's editorial practices in place. In an analysis of these images, five categories of images have been identified.

The first group of images provides evidence of the nature of destruction caused by the attacks—visual evidence that professional journalists would not have been able to capture unless they had been at the scene of the attacks. Figure 2 presents evidence of the destruction that was caused by the bombs.

As can be seen in the photograph supplied here, the quality of the image is worthy of publication; others may not have been, which may account for the limited number of images that the BBC decided to release of the attacks. In addition, it may have been that editors felt that it was of no use publishing dozens of pictures of the same content.

The second category of photographs consists of those submitted to the BBC by individuals caught underground following the attacks. The five images chosen for publication by the BBC provide evidence to supplement our understanding of how some people behaved during the attacks.

Figure 2: An Office Worker Took These Photographs From Her Workplace.

Figure 3: Passengers Are Led Through the Tunnels to Safety.

The third category comprises photographs of attack survivors.

Figure 4: Graeme Weston:*" I met these two people at Tavistock Square walking to hospital. They said they were in the front carriage of the tube as it left Kings Cross when a bomb had exploded. They said they were the lucky ones."*

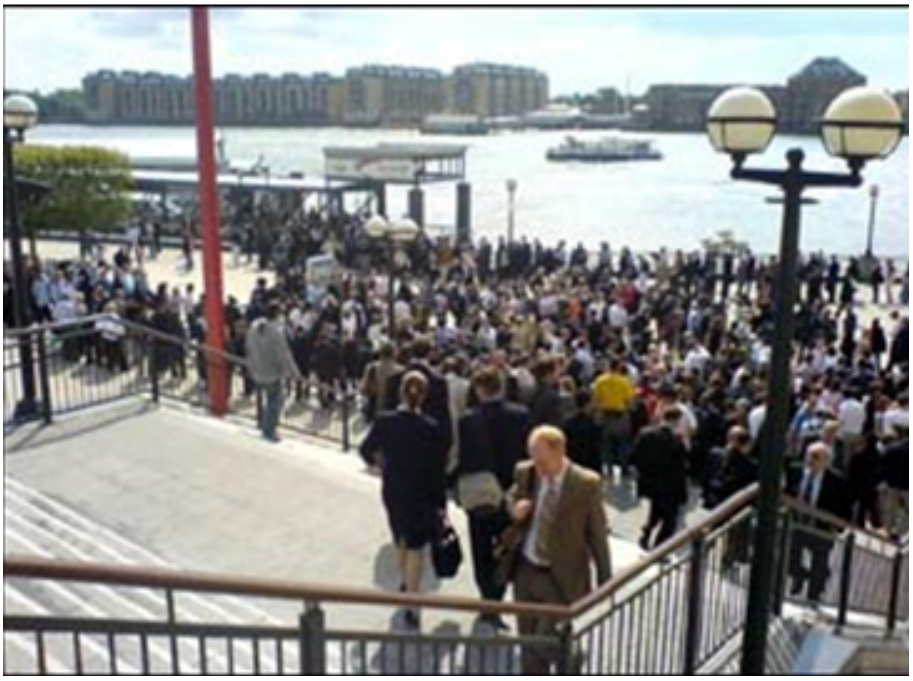
The fourth category of photographs consists of three images documenting the presence of the emergency services following the attacks. People then, are not only taking photographs at the onset of an event; they also take photographs after the event has taken place.

The final category of photographs comprises images of people seeking a way to go home or elsewhere following the attacks.

A range of different types of photographic evidence was submitted to the BBC for publication. Images are not simply restricted to photographs of destruction, but serve to provide a wider contextual and visual representation of the public response to the London attacks. Photos chosen for publication by the BBC can be seen to tell a story of the unfolding events of the day—ranging from images that present the beginning of news about the blasts; to images of people caught underground, victims, and emergency services; and finally, at the end of the day, pictures showing Londoners attempting to travel to alternative destinations.

Figure 5: Bettina Strenske Sent This Picture of Police Clearing the Streets.

Figure 6: Tim G: ***"Water was the best way off Canary Wharf and the queue was enormous but good-spirited. This picture shows about one third of the people."***



As a form of data for research purposes, photographs from dependent citizen journalists are extremely useful forms of data for visual research practices. As identified by Bryman (2008), although the use of visual methods in social research declined following the Second World War, there has been a recent revival. Not only can photographs of a disaster be used as a source of data for secondary analysis of data from a disaster, but in addition, they could potentially be used for future research in the aftermath of a disaster as a form of photo-elicitation in qualitative research practices for example as prompts for discussion.

Conclusion

Assessing citizen journalism in the wake of a disaster offers social scientists the opportunity to assess evidence created during a crisis. Although it does not singularly provide enough evidence to explain how communities cope in a disaster, citizen journalism does facilitate an understanding of the response capabilities and difficulties posed by the public. Furthermore, the act of participating in the reporting of an event shows that, rather than cowering in fear, people actually stop to record and participate in the wider discussion and production of information. This alone is an interesting area of enquiry, particularly if we are interested in individuals' motivations following a disaster. This information should not necessarily be used by itself to understand the public response to adversity, but can be used alongside other forms of independent research to assist a more comprehensive understanding as seen in the work of Drury et al. (2009).

As noted in other studies, there is also great potential for citizen journalism to be of use in responding to a disaster. For instance, in their study of citizen journalism in the wake of the 2007 California wildfires, Novak and Vidoloff (2011, p. 196) found that citizen journalism not only provided more real-time news than professional journalism, but in addition had the potential to help frame official response to disasters. Current research projects such as a project being run in Australia titled Mapping Online Publics (2011) focuses its efforts on understanding use of social media, including acts of citizen journalism following a crisis—providing evidence as to why it is necessary for disaster researchers to engage further with research relating to the digital arena. However, while this is predominantly a positive view of citizen journalism, it is important to note some more negative consequences of citizen journalism.

During the analysis of citizen journalism following acts of terrorism, a query was raised in *The Guardian*. Following the Glasgow attacks, Welsh (2007) was concerned about whether individuals would place themselves in danger by trying to record evidence and ignore their civic duty to assist others. This is an extremely interesting area of consideration for sociology that should be investigated further. Sociologists need to develop a greater understanding of the motivations behind citizen journalism. Welsh also brings attention to the issue of how far people will go to participate in citizen journalism.

Will individuals put themselves in danger to satisfy their need to record events for publication? Does citizen journalism pose a threat to security and safety? From a practical point of view, if first responders are to utilise citizen journalists in the official response to a disaster, they must take these individuals' safety into consideration.

Another way of viewing the dangers associated with citizen journalism, is by developing an understanding of whether or not such behaviour is anti-social (Bakker and Paterson 2011, p.191). Baker and Paterson (2011) refer to the work of Glaser (2005), who investigated the idea of citizen journalists acting as "citizen paparazzi" after the London bombings.

> That naked impulse to tell a disaster story, glaring kleig lights and all, was once the province of mainstream and tabloid news organizations. But no longer. Now, for better and worse, our fellow citizens stand by, cameraphones in pockets, ready to photograph us in our direst times.

Glaser points to Jardin, a freelance technology journalist, who raises the question of the ethical implications of citizen journalist behaviour. If we are able to utilise technology to capture people in their "direst times", we therefore have an ethical obligation to consider our actions—particularly in relation to norms such as compassion and responsibility. This is consistent with Welsh's (2007) questions of why the people with the mobile phones choose to take pictures rather than step in and help. It is essential therefore, to question what citizen journalism means for our morals in certain situations. Furthermore, we must consider, as researchers, the various ethical considerations of using this data.

From a research perspective, there is a wealth of ethical considerations to be addressed in terms of accessing and using material posted by citizen journalists. A number of studies discuss some of the ethical concerns of accessing online data such as that posted on social networking websites and blogs (Berry 2004). There appears to be particular attention paid to the security surrounding access to information and whether information is in the public or private sphere (Lange 2008; Berry 2004). For researchers interested in studying citizen journalism data, it is necessary to take appropriate ethical measures.

The wealth of information available on the Internet brings with it issues regarding whether the information is "trustworthy, reliable or relevant" (Youngs 2009, p. 136; Keen 2007), and what other uses information might have. As a result, Youngs (2009) argues that it is necessary for audiences within the blogosphere to be critically active rather than consuming information passively, individuals must sift through the mountain of information that is available to them and use their knowledge and intuition to decipher its meaning. This was particularly relevant following the Mumbai (2008) attacks where the BBC were criticised for their reliance on Twitter users.

More recently, following the April 2012 Indonesian earthquake and the subsequent threat of a tsunami, there was the added danger of false videos being placed on YouTube. One video in particular (Mudaduda 2012) claimed that the Indonesia earthquake had caused a tsunami. The availability of this video was announced on Twitter, yielding the potential to attract a vast audience. Subsequent Tweets claimed that the video was false (see Figure 7). The Pacific Tsunami Warning Centre (PTWC) announced that there was no impending danger of a tsunami (PTWC 2012). Within a day this YouTube video received over a million views. From a research perspective, this example—as well as others such as the Mumbai terror attacks—indicate that it is of the utmost importance for researchers to take into consideration the validity of the data under inspection.

Figure 7: Indonesia Earthquake & False YouTube Videos 2012

As researchers, it is our responsibility to understand and consider the perspectives and experiences of others. As shown here, material created by the public provides a unique insight into the experiences of ordinary citizens during a disaster that can be utilised with other forms of data and research practices to provide a more comprehensive understanding of the public's response to disasters.

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Social Time and Disaster

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Abstract

Time permeates the disaster process. Yet, few scholars have integrated various notions of time in their disaster studies. In this paper, I introduce the ideas of event time, clock and calendar time, social time, and rhythm of life within the context of the pre-impact, impact, and post-impact phases. Simply, day-to-day life in industrialized society is based upon a series of schedules, calendars and routines on a daily, weekly, and yearly basis. Events that we call disasters and catastrophes upset our normal rhythm of life, creating degrees of social disruption from the individual up through the community units of analysis. Social units in impacted areas move from clock and calendar time (doing what is scheduled) to event time (doing what is needed now) when disaster strikes. The process of recovery is reflected in attempts to reestablish these same (or similar) clock and calendar time patterns as before the disaster.

Key Words: Social time; Event time; Clock time; Life cycle of disasters

Introduction

In this theoretical paper, I advocate the use of social time in order to obtain a clearer understanding of disaster. Key concepts related to time used throughout this paper include, event time, clock time, calendar time, and rhythm of life. Although disaster researchers have used the notion of social time in disaster research, at best they have generally relegated the concept to a sentence or small (e.g., Neal 1997; Quarantelli 1998; CDRSS 2006). Specifically, I draw upon general works on social time that related to the idea the patterns of everyday life or the rhythm of time (e.g., Zerubavel 1981; Hall 1983), which in turn serves as a point of comparison when events lead to social disruptions (Fritz 1961). In addition, I draw upon related theoretical and empirical studies disaster studies and some of my own disaster fieldwork for further illustrations. In short, these

and other studies noted in this paper demonstrate an underlying interest and further need in exploring the relationship between disaster and social time.

To punctuate the importance of time in this field, consider how the general notion of time serves as the defining component of our two main approaches to our field – disaster and hazard (CDRSS 2006). In essence, hazards are events waiting to occur. By contrast, disasters are the actual events. As a result, the hazards tradition has focused upon pre-impact type of activities (i.e., mitigation, some preparedness). By contrast, the disaster tradition initially looked at response (i.e., impact) issues and to a lesser degree preparedness activities (Phillips, Neal and Webb 2011, pp. 40-42).

In organizing this paper, I draw upon a specific notion of social time – disaster phases. Going back to Carr's (1932) early work on disaster phases, researchers have used a wide range of possible approaches and categories to reflect the disaster life cycle (Neal 1997). Since the recommendation by the National Governor's Association (1978) to organize hazard and disaster events under the categories of preparedness, response, recovery, mitigation, the four phases of emergency management have received extensive support and use by disaster professionals and academics. For these two groups, the "four phases" provide an excellent heuristic devise for organizing data, information, or activities (Neal 1997).

Yet, these and other life cycle configurations present analytical problems (Neal 1997). First, these categories are not mutually exclusive. Put another way (and demonstrated below), the phases of disaster overlap. Thus, the four phases (and other life cycle configurations) are at best a "heuristic device" rather than a concept for scientific analysis. Second, in part related to the first point, the use of any set of disaster phases force both professionals and researchers to look at disasters in a way that really does not exist (Neal 1997). Finally, various disaster phase categories draw upon the use of everyday language rather than being grounded in any type of empirical reality or conceptual/theoretical framework. Thus, these categories come with the baggage of meanings attached to everyday life. Such simple terms as pre-impact or preparedness, for example, may have multiple meanings amongst multiple actors. As Quarantelli and Dynes (1977) show, the concept *disaster* has similar problems, being a "sponge" concept that has soaked up multiple everyday life and scientific meanings.

Using some form of disaster phases makes some sense to organize an initial paper on disaster and social time. I will use the stages of pre-impact, impact, and post-impact to organize the structure of this paper. Yet, by using this type of configuration, I recognize that I will encounter the problems I have already noted above. For example, some of my discussions on pre-impact topics slide into impact issues. Or, some illustrations regarding impact patterns cross into post-impact activities. Until we devise better social time and disaster concepts, these three stages will serve as my mechanism to order this discussion. In short, I hope to invoke new ways we can understand the social process of disaster with the use of time.

Event Time

For thousands of years, cultures throughout the world have operated on event time. Event time occurs when people perform activities based on necessity. For example, people ate when they became hungry. They awoke when the sun rose and went to sleep when the sun set (which, except in the tropics, varies from season to season). Farmers planted and harvested crops when it was time. Even the flooding of the Nile River thousands of years ago was an event that would set the stage for the start of a new agriculture cycle in Egypt. Based upon the region and irregularities of weather (e.g., temperatures, rain), the planting and harvesting of the crops could vary greatly based upon a calendar (Landes 1983; Steel 2000).

Religious practices created the need for activities during specific times of the day (i.e., "clock time"), week, or year (i.e., calendar time). For example, in about the 12th century, religious practices by monks in Europe demanded the need for clocks, calendars and schedules. Monks would rise the same time every day, and throughout the day engage in various tasks (e.g., praying, copying texts, eating, attending mass). Each day would also have a different set of tasks driven by the clock and the calendar. Of course, the culmination of these activities occurred on Sunday, in which a rigid schedule of mass occurred. In short, the clock and calendar, not events based on need, activated specific behaviors (Landes 1983).

The use of "clock time" later facilitated the emergence of industrialization. Rather than following the rules of event time, industrialization demanded clocks, schedules and calendars for production and management reasons. Urban areas, the centers of industrialization, adapted to clock time. By comparison, agrarian areas stayed with event time, which in turn created a further schism between urban and rural settings. Thus, clock time drove modern industrial societies and those living in such settings. Zerubavel (1981, p. 7) states this quite nicely:

> In general, most of our routine daily activities are scheduled in a fairly rigid manner for particular times of the day and for the particular days of the week. Thus, we usually eat not necessarily when we are hungry, but, rather, during officially designated eating periods such as "lunchtime" or "dinner time." Similarly, we usually go to bed not necessarily when we get tired, but rather, when it gets "late." Cleaning one's home is another activity which typically takes place not necessarily when things get dirty, but, rather, on particular days of the week that are designated as "cleaning days" in a standard fashion.

In short, many societies today, especially industrialized societies, operate on clock and calendar time.

Social Time and the Rhythm of Life

Both event time and clock/calendar time take on social meaning, thus creating the notion of social time. Social time influences how we perceive events, what we to do within a specific period (e.g., clocks, calendars and schedules), and how we may perceive the pace of time (e.g., fast or slow). Simply, social time drives many of our collective actions and activities. Some components (e.g., minutes, hours, days) originate from measures of objective time since they rely upon astronomy or consistent pulsing of radiation. Yet, these objective measures take on social meaning and are used to create schedules. For example, hours, days, specific dates and even years serve as important socially defined markers or take on special meanings for specific activities. As a result, *social meanings based upon objective measures of time emerge*. Schedules and calendars reflect socially defined institutionalized rituals among and within societies, organizations, institutions, families, groups and subgroups. A wide range of events or time markers, such as holidays, work schedules, times for worship, sleeping, eating, waking, vacation and recreation may all occur annually, monthly, daily and at certain times of the day.

The intermeshing of these activities based upon social time generates patterns of behavior at both on the macro and micro sociological level. When we combine social time markers with the macro and micro socially defined activities, we build connected and institutionalized social cycles that create a rhythm of live. These cycles and rhythms produce some degree of predictability to our lives, which in turn helps to maintain some form of social order (Zerubavel 1981, p. 8-12). Similarly, Hall observes (1983:153) "individuals are dominated in their behavior by complex hierarchies of interlocking rhythms." Although beyond the scope of this paper but appropriate for later investigation, integrating social time and disaster allows us to explore key theoretical issues in sociology related to units of analysis, social order, and social change—along with the central topics of deterministic and voluntaristic behavior (e.g., Alexander 1982).

Cultural Influences of Time

Culture influences how individuals perceive and interpret time (i.e., pace of time, power, expectations of everyday life). Let's look first at the pace of time. Generally, individuals may perceive the passage of time quickly or slowly, depending upon the circumstances or event. For children, the days or weeks before a major holiday may seem to take "forever." For a new couple madly in love, their first six hour dinner and movie date may feel like one hour's worth of time. Broader cultural influences also impact the pace of time (e.g., Sorokin 1943; Lauer 1981; Hall 1983; Levine 1997). As Zerubavel

(1981) documents through his extensive observations of different regions and peoples, Latin cultures operate within a slower, less precise notion of time. By comparison, Northern European cultures have a faster, more precise meaning and use of time. He also demonstrates that in the United States, geography influences different versions of time. One living in the South experiences a much more leisurely pace of time than those living in the North. Certainly, urban areas operate at a quicker and more precise pace than most slower rural settings (Zerubavel 1981).

Consider for a moment how a culture's pace of social time could influence the expectations (and perceptions) of disaster response and the transition to recovery. One could theorize that in northern Europe, social expectations would be quite high for a quick, or "on time" response. Even in the United States following Hurricane Andrew, the local disaster coordinator was exclaiming "People are dying. Where is the cavalry?" when in fact FEMA had already arrived. Gleick (1999) describes how in American society individuals try to do as many tasks as possible, and as fast as possible. Perhaps his notion of "faster" is worth exploring regarding citizens' expectations of federal, state and local response and recovery activities. For example, one could compare cultural expectations in the United States to those in other geographical regions. Would, using an objective measure of time, response be slower than in the United States or Northern Europe, or Central and South America? Would expectations and perceptions in countries of these regions be different than under their own "normal" conditions? Perhaps an analysis of disaster archives, such as at the Disaster Research Center at the University of Delaware (with about 50 years worth of data) would reveal "faster" expectations in disaster. Put another way, how "fast" is an effective and efficient disaster response and recovery, and what influence may culture have upon these collective expectations?

The use and pace of time is also interwoven with power. In designing new societies, both Comte and St. Simone created calendars in part to maintain social order by controlling time amongst the populace (Coser 1977). Certainly, we are all familiar with the relationship between the length of time a person waits to see another person and power or prestige. The speed of recovery activities following disaster provides a unique perspective to understand issues related to increased vulnerability and power. For example, ethnic minorities, those in lower social classes, and women and children appear to move thorough the recovery process slower than others (Neal 1997; Phillips 2009; Dash, McCoy and Herring 2010; Blinn-Pike 2010).

Next, by drawing upon the ideas of social time, the rhythm of life, and social order, I argue that we can think of disasters as occasions that disrupt our socially defined routinized activities or "rhythm of life." Such social disruptions can occur whether a society operates within event time or clock time. However, those societies that have much more rigid ties to clock time will incur much more social disruption. Furthermore, during more extreme cases of social disruption (which we may call a "disaster"), we would see that different units of analysis (e.g., individuals, groups, communities) would

operate on event time (e.g., tending to activities that need to be done) rather than clock or calendar time (i.e., following a predetermined schedule). Later in the paper, I also show that part of the process of recovery from disaster and a return to "normalcy" specifically hinges on (re)creating a similar or even new predictable rhythm of life. For the purposes of this paper, my discussion will focus upon social disruption of highly routinized settings normally driven by clock time (which would represent most if not all industrialized societies).

Social Time and Social Disruption

Social disruption plays a central role in many definitions of disasters. A traditional starting place for understanding disaster is Fritz's (1961, p. 655) adaptation of Endleman's definition:

> an event, concentrated in time and space, in which a society, or relatively self-sufficient subdivision of a society, undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of the essential functions of society is prevented.

Two ideas from this definition, although not necessarily in the exact meaning as used above, become key components for this section: time and social disruption. Since I have already discussed the notion of social time related to social order (or the rhythm of day-to-day life), next I will elaborate on social disruption.

Bates and Peacock (1989, 1992) and Stallings (1998) discuss the general notion of social disruption in relation to disaster, but in a slightly different context than this paper (i.e., social time is not a key factor). Yet, their logic, which relates to varying degrees of social disruption and different units of analysis, provides an excellent foundation for my discussion. In addition, I note the idea of "post disaster rituals" as a mechanism for communities to consider the past while moving forward to their new normal (Thornburg, Knottnerus and Webb 2007).

While focusing specifically on the issue of disaster recovery, Bates and Peacock (1989) contend that events in the social environment lead to the organizational or systematic failures. As a result, daily normal patterns of system or organizational behavior become disrupted. Thus, new, *ad hoc* patterns develop to manage the event and assist in bringing matters back to normal. As a result, recovery becomes "the process by which a system which has experienced a structural failure . . . reestablishes a routine, organized, institutionalized mode of adaptation to its post-impact environment (Bates and Peacock 1989, p. 353)." In addition, they stress that researchers must also consider the impacts at different units of analysis. For example, a few households impacted by an

event will not create broader social disruption within a community. However, a much larger scale of impact among many more households will generate much more social disruption—hence an event that we call disaster (Bates and Peacock 1989, 1992).

Although not couched in such ideas as "social time" or rhythm of life explicitly, Stallings (1998) provides additional insight into the relationship among social time, social disruption and disaster. Stallings grounds his discussion in the classical sociological theoretical foundations of Marx, Durkheim and Weber, focusing on the key issues as social order, social change and emergence. Rather than use the word "disruption" due to the multiple meanings it has, he uses the concepts of routines, exceptions and exception routines. Stallings (1998, p. 137) talks about routines as "Actions and interactions repeated routinely provide structure for individual's lives and, in the aggregate, constitute the structure of social systems." His ideas of routines do reflect what social time scholars refer to as the rhythm of life. In relation to disaster, his notion of routines reflects everyday life activities. His second category, "exceptions," reflects patterns of behavior that must change due to a specific event. Units of analysis may be impacted differently by such events. Stallings notes that, at an organizational level, fire departments handle fires and courts handle divorces on a "routine" basis. However, at the individual or small group level, a house fire or divorce are exceptions to daily action. Events that disrupt the routine at the macro level then become "exceptions," resulting in what we may describe as a response to disaster. Stallings' notion of "routine exceptions" reflects a social unit's attempt to handle events that may occasionally occur. As a result, fire departments develop to handle house fires, while local, state and federal emergency management organizations develop to handle disasters (Stallings 1998). Thus, the logic behind Stallings' ideas of routines, exceptions, and exception routines within various units of analyses influences my rationale throughout this paper.

Ritual is another component of the rhythm of life. These rituals help to further provide meaning to day-to-day life, including stability (or social order). When disaster strikes, many rituals may disappear (i.e., "deritualization)." As a result, social participants begin socially constructing new meanings and rituals to provide new meaning and structure to life (Thornburg, Knottnerus and Webb 2007).

Drawing upon the work noted above, in my next section (i.e., Pre-Impact), I describe in more detail the rhythm of life in the context of daily or everyday life, and how macro level entities (e.g., communities, cities) can absorb social disruptions that occur at the micro level. Next, looking at the impact period, I provide empirical examples how occasions can create disruptions at the micro and macro level, resulting in major social disruptions and throwing the rhythm of life out of synchronization. Finally, I discuss the role of social time in understanding the post-impact (or recovery) process.

Pre-Impact

As noted above, social time creates a rhythm of life. This rhythm makes predictability or social order possible on a daily, weekly, monthly and yearly basis among individuals, households, families, groups, organizations and communities. Consider our own daily, weekly and yearly patterns. During the week, we generally awake at the same time and then follow through with the same morning rituals (e.g., use of the bathroom, eating) before we begin our work. We may take the same mode of transportation and the same route to work every day. These similar patterns continue through the week. For many academics, due to our teaching schedules, Mondays, Wednesday, and Fridays may be more similar while Tuesdays and Thursdays may be more similar. At the end of the semester, we settle into another (predictable) set of routines until the start of the next semester. Planned disruptions to these routines, such as holidays (e.g., birthdays, Thanksgiving) or business travel occur. However, we have plans for these events. In short, we can see our daily, weekly, monthly and yearly activities as part of a rhythm of life—a rhythm we generally count on to help manage our lives.

Within this context, certain events may disrupt individual lives. For example, we may lose electricity or water, which interrupts our morning activities. A car accident may interrupt the drive home. On a more personal level, a family member may have a heart attack or a neighbor's house may catch on fire. For a while, the victim's or victims' own daily patterns of activity will change (i.e., are disrupted). Also, those closely associated with the victim(s) may make temporary changes in their daily patterns of behavior. Such events could put a strain on the victim(s) and even victims' primary group's (i.e., family and friends) resources. In some cases, the victim(s) may even die, perhaps creating broader changes for the family and friends of the victim(s). However, outside of the sphere of family and friends, in most cases life goes on normally in the neighborhood, community or society.

Indeed, communities and societies prepare for these types of events that may impact individuals, families or small groups. Various organizations within the public and private sector handle these types of events on a daily basis. For example, fire departments in the United States design their organizations to respond to fires, traffic accidents, small hazardous materials incidents, heart attacks, and similar incidents. Predictable trends help to budget resources and personnel activities. Data show that on a daily basis, the times between 3:00pm and 5:00pm result in the most fire runs. More broadly, mid-afternoon is the busiest time, whereas pre-twilight has the fewest number of runs (Topical Fire Report Series 2007). Certain days of the year also have fire peaks. Holiday events such as the 4th of July and New Year's Day are associated with fireworks and lead to two of the three highest peaks of fire runs on a yearly basis. Warm weather brings people outdoors in the spring, leading to another spike in fires (FEMA 2004). For firefighters, March and April are the busiest months, whereas November is the least busy (Tropical Fire Report Series 2007). In short, the fire community has a strong idea of fire trends on an hourly, daily,

weekly, monthly and yearly basis. These patterns fit a much broader rhythm of life, and are in part tied into holidays, celebrations and the weather.

Other local organizations such as police departments, public works departments, and the utilities all assist handling such emergencies when called upon. Local volunteer organizations (e.g., the Red Cross, Salvation Army) may help feed emergency responders or assist a family affected by the event. Hospitals, especially emergency room staff, also plan for and expect a certain number of patients on a daily basis. At some times (e.g., Saturday nights) they may have additional staff on hand, knowing that the medical needs will be greater than at other times (e.g., Wednesday mornings). Local citizens would express anger if local government and other organizations that participate in emergency response activities could not handle such routine accidents and events.

The types of events noted above do not disrupt the operation of a community. In fact, these emergencies actually become part of the rhythm of life since they too often take place on a generally regular and predictable basis. At the macro level, organizations or communities expect and absorb the disruptions at micro levels. As a result, the micro disruptions have little if any impact upon the rhythm of life at a more macro level (e.g., community). The cold harsh reality is that although individuals or small groups may experience emergencies and specific organizations respond to these events, for the rest of the people within a neighborhood, community, or society, the rhythm of life beats on.

Yet, if an occasion occurs that disrupts social time and the rhythm of life at a more macro level (e.g., such as a community), the normal routine for the community (including individuals, families, groups, and organizations within the community, or put another way, both micro and macro levels) changes dramatically. In fact, such a broad change in the rhythm of life would result in an event that we know of as a disaster or catastrophe. The distinction of social disruption at the micro versus the macro level also highlights a key sociological component of disaster. For example, Mills (1959) differentiates between a "trouble" and an "issue." Let's apply Mills' concepts to this context. If one family's house burns down it is a routine event for emergency response organizations and related businesses (e.g., insurance, clean-up companies, construction companies). For the family, it is a "trouble" or problem, but life continues within the sphere of the community. However, when an event such as a wildfire, tornado, or earthquake destroys 500 homes and a wide range of lifelines (e.g., water, sewage, electrical power, transportation) within a community, an "issue" emerges. The patterns of hundreds of victims are disrupted, but so are the patterns of the complete community. Victims and members of the community must face a much larger set of social problems – problems that impact the whole community and perhaps beyond.

By integrating the ideas of social time, the rhythm of life, units of analysis, and social disruption, I set the stage to then differentiate among the commonly used terms "emergency," "disaster," and "catastrophe" by looking at how various institutionalized routines may become disrupted. When these disruptions are minor and/or are actually

part of the predicted routine within a community, then such events are emergencies. They are part of everyday life. As I show below, when both macro and micro units of analysis become socially disrupted, the occasion then becomes some degree of a disaster. If the level of disruption expands to beyond the community, such as in the cases of Hurricanes Andrew or especially Katrina, then a transition occurs from disaster to catastrophe. Others (e.g., Britton 1986; Quarantelli 2005; Fischer 2008) have already suggested that some form of a "continuum of disaster" exists. Here, I am suggesting that an empirically derived measure of social disruption can capture one dimension of a continuum of disaster.

Thus, this discussion highlights the importance of understanding the pre-impact setting when studying how disasters impact various social units with a community (or even higher units, such as a region or even nation). Specifically, one must understand the pre-impact rhythms of life, including how people and organizations use social time, calendars and schedules, before one can assess the actual impact of a disaster or catastrophe, and how a community then strives toward recovery.

Impact

In the section above, I showed how perturbations impacting the rhythm of life of a few individuals or other small social units (e.g., families, small groups) are part of everyday life and can be called emergencies. Although such daily events may be "troubles" at the macro level, organizations and communities generally are well prepared to manage these events. As a result, the overall rhythm of life continues. In this section, I show how macro social disruptions (coupled with micro social disruptions) in the rhythm of live create situations that lead to what could be considered a degree of disaster or catastrophe.

General Examples

Consider what we may call a disaster of any type in any major community. Before the event, a wide range of interlocking schedules, calendar time and clock time guides behaviors and creates a predictable social order for individuals, families, groups, organizations and communities. Yet, when a disaster occurs, the hourly, daily, weekly, monthly, and yearly schedules for many no longer matter. The situation demands that individuals, families, groups, organizations and communities move from clock time to event time. The event creates a situation that different and/or new sets of tasks and/or social organization (aided by the emergence of new roles and norms) must develop now (i.e., event time) to deal with a new set of demands generated by the event (Dynes and Quarantelli 1968; Dynes 1970). In short, these new activities are not based upon a calendar, schedule or clock (i.e., clock or calendar time). Rather, immediate needs drive

activities such as clearing debris, searching for the living, delivering victims to the hospital, establishing shelters, and providing food for victims and responders (i.e., event time). City officials may cancel other scheduled activities, such as the enforcement of parking tickets, garbage pickup, and recreation league sporting events. These activities become of minor importance since they divert resources needed for the response. As a result, authorities may minimize or cancel these scheduled activities during the initial response. They will direct their personnel and resources to event based needs (e.g., debris clearing, search and rescue, restoration of utilities, setting up shelters, providing food for victims) rather than calendar or clock time activities.

Compare the various events of car accident, medical emergency, or house fire with the social impact I observed during field trips of Hurricanes Andrew or Katrina. As already noted above, in the cases of the car accident, medical emergency, or house fire, the rhythms of life for the community continue with little if any disturbances or problems. By contrast, individuals, families, groups, organizations and various communities impacted in the Miami, Florida, or New Orleans, Louisiana, areas faced enormous disruptions with their rhythm of life. For example, most if not all commerce stopped within these and nearby cities. Jobs vanished. And victims went without shelter and food. People moved from their residences to other abodes. Following Hurricane Andrew in Homestead, Florida, some survivors lived in tent cities for months. In the case of Hurricane Katrina, many survivors relocated out of state. The hurricane's destruction of lifelines also changed totally the rhythm of life. Ruined vehicles coupled with damaged or flooded roads made transportation virtually impossible for days. Some victims and responders went weeks with no electricity, phone service, water, and sewage. As a result, the lack of an infrastructure further disrupted the normal, typical every day routines of the residents. The pre-impact clock time, social calendars and schedules of simple normal activities such as sleeping, eating, drinking water, or using the toilet became major chores. Ironically, in order to establish a new form of social order, or new rhythm of life, victims had to make new schedules for some of these activities. With commerce stopped and schools closed, people had "new time" on their hands to manage.

Not only were individuals' daily routines dramatically altered, the consequences of the storms stripped local emergency response organizations from any type of effective response. Each city and surrounding areas needed large amounts of outside resources to meet the basic needs (e.g., food and shelter) of the victims. Therefore, cities changed their initial priorities to the main provisions of life—food and sheltering. The survival of the communities, the welfare of homeless victims, and the re-establishment of infrastructure highlight just a few of the major priorities. With a lack of resources, and community goals shifting to basic survival, many day-to-day local government and business operations ceased to exist. In some cases, the personnel and equipment were not available. Due to the destruction, some people could not get to their jobs right away. Even if people could travel, jobs did not exist.

When disaster strikes, those in the impacted area, whether individuals, families, groups, organizations or other configurations, transition from social time to event time. These entities no longer engage in actions based upon a calendar, schedule or clock. Rather, behavior becomes focused on a completely new set of tasks generated by the disaster—and the sooner (i.e., the pace quickens) those tasks are accomplished, the better. *When disaster strikes, event time trumps clock time*.

To summarize, two interrelated social time events occur when disaster strikes. First, the rhythm of life becomes disrupted at both a micro (e.g., individual, household) and macro (e.g., organizations, community) levels. Second, the generation of unmet needs and new social priorities creates a major change from clock time to event time. In order to meet the immediate needs generated by the unmet needs (e.g., search and rescue, sheltering victims, clearing road debris), day-to-day and weekly schedules become irrelevant during disaster. Yet, as the event proceeds, new schedules emerge, combining both event time activities and emerging new schedules during the response in order to manage the event. The search to mobilize new resources (and the creation of emergent groups to assist with this and other processes) eliminates pre-impact schedules, calendars and rhythms of life which, in turn, creates a whole new—albeit temporary—rhythm of life. Then finally, as I discuss in the post-impact section, a community strives to transition back to a semblance of its pre-impact rhythms.

Some Empirical Examples of Social Time during Disaster

Social time has generally not been a part of theoretical or empirical discussion regarding disasters. However, a few studies have integrated the idea of the rhythm of life, time, and social disruption to understand disaster. Below, I discuss these few empirical studies that look at the notion of social time and social disruption. One looks at how citizen populations adjust to war and potential bombings, while two others describe the transition from social disruption to a reacquisition of a pre-impact rhythm of life during post impact or recovery phase following a tornado and volcano.

War and the Interrupted System. Kimmerling (1985) looked at the unique situation in Israel and how civilian society responds to the "interruption" of war. While primarily focusing upon the 1973 war, he also integrated observations and data from the 1967 and 1982 Israeli conflicts. Since much of disaster research was initially grounded in preparedness and response to war (e.g., Quarantelli 1987), Kimmerling's observations fit well with the theme of this paper. Specifically, Kimmerling (1986, p. 84) looked at how the 1973 war influenced individuals' and families' routine activities. A few of the routine activities continued or increased over time (e.g., prayer, listening to the news, taking medication smoking, reading the newspaper). However, a large number of activities (often associated with a specific time of day) significantly decreased (e.g., sleep, studying, handicrafts, traveling) during the war. A few specific activities had rather large

decreases (e.g., regular eating, meeting friends, cleaning one's home, care for personal appearance, reading books). Kimmerling's (1985, p. 113-114) detailed analysis led to the following conclusion:

> In times of social interruption, most of the activities (except for going to work and prayer) become marginal – even in terms of the complementary goal-and indeed there was a general tendency in the system to appeal for a moratorium (to a differential extent) from the fulfillment of various routine roles, which indeed aided in maintaining the individual's "cosmic order," but whose contribution to the systems upkeep seems to have been perceived as marginal.

Social Disruption and Disaster Phase Transition. Perry and Lindell's (1986) analysis of the volcano threat around Mt. Saint Helens touched upon household routine and disruption. The community of Toutle, Washington, suffered more damage from the volcano than did Lexington, Washington. As a result, only 24% of the Toutle residents believed that the volcano did not impact their household routine. On the other hand, almost 56% of the Lexington residents believed the volcano did not disrupt their household routine. In fact, not one Lexington resident responded that their routine was significantly disrupted, whereas almost 13% in Toutle believed so. The authors suggested that the volcano threat created a situation where new behaviors and beliefs were needed to cope with the new threat. As a result, what had been a disruptive situation had become a way of life.

While also documenting that response and recovery phases are not discrete events, I drew upon social disruption and the time it took for "normal" services to return to a community following a tornado (Neal 2004). In describing the transition from response to recovery, I used a wide variety of activities and events to "mark time" in understanding when response started and ended, and when recovery began. Some examples of these events and activities include:

- the opening and closing of a command post
- the sheltering of victims
- the beginning and ending of search and rescue activities,
- the disruption and restoration of electricity, phones, gas, water and sewer service
- establishment and demise of a curfew
- beginning and ending of volunteer organizations assisting the community

This paper has notions of social time and event time embedded within its findings. First, I showed suggested that some events must finish (e.g., road debris cleared) before other events (e.g., re-establishment of electrical power) can begin. Thus, how well or

poorly authorities manage one issue can affect following events. Second, my data documented clearly that response and recovery activities overlap. Put another way, we cannot pinpoint the exact time when response ends and recovery begins. As a result, I contend that asking questions such as "how long will it take to recovery" may not be appropriate.

Improvisation, Role Conflict and Social Time. The concepts of improvisation and role conflict also relate to social time, disruption and, disaster. Social schedules define the day's activities for people. Within these schedules, people take on specific roles. For example, 6:00 a.m. to about 8:00 a.m., one could have the role of parent. From 8:00 a.m. until noon, one would have a professional role (e.g., professor). Lunchtime could mean a planned lunch with one's significant other. Such schedules and calendars may diminish opportunities for spontaneous behavior (Zerubavel 1981, p. 47-49). Yet, as research shows, when disasters strike, people and individuals must abandon their pre-disaster schedules and roles to deal with the new tasks. Put another way, they must improvise (Webb 1998; Kendra and Wachtendorf 2003; Mendonça and Wallace 2004). Whereas rigid schedules and a lack of spontaneity drive everyday life, disasters destroy scheduled events and force spontaneous behavior and improvisation based upon newly developing needs.

Role conflict and abandonment in disaster emerged as a controversial issue regarding the development of nuclear power plants following the Three Mile Island incident in 1979 (Dynes 1986). The issue still arises at times in regard to disaster planning and response. Although grounded in a long line of sociological research, role conflict is actually another example showing how schedule, social time and social disruption all intersect (McGrath 1988). For example, emergency responders cannot be at different places at the same time look after their families and do their professional jobs. Not only is this a matter of role conflict, but actually time conflict. Their schedules during disaster suddenly overlap, and as Dynes (1986) clearly demonstrates, the professionals tend to their jobs. Yet, these professional do not abandon their jobs, or their families. Informal mechanisms and networks keep families and responders in touch. In summary, the management of role conflict in disaster is actually another example of how social disruption and the use of social time can be used to understand what occurs during disaster impact.

Post-Impact

For this paper, I define the post-impact period as the process of various social units moving back to the new normal rhythm of life in part through clock and calendar time (rather than event time). Post-impact research has generated some of the more explicit examples of (social) time, generally under the rubric of "recovery." In the first part of this section, I will discuss how research on the recovery phase has shown that sub-stages of recovery appear to go through different (and overlapping) steps, and that these steps

may appear at different rates of speed. Thus, using objective time, one type of event may move through recovery more quickly or slowly than others. Furthermore, different segments of society or individuals (based such factors as social class or ethnicity) may move more quickly or slowly through various phases of recovery than others. Second, I apply a term from the social time field, *entrainment*, to provide additional insight on how social time is useful for understanding post-impact events. In this case, when events may shake or shatter the rhythm of time or an individual, group, or community, these entities have a natural tendency to return to pre-event patterns.

Post-Impact Empirical Studies

Trainer and Bolton (1976) compared the recovery process following the Managua earthquake and Rapid City flood. In my view, their analysis is one of the first that explicitly touches upon the importance of social time and social disruption. They noted that during recovery, daily routines may be difficult to reestablish based upon strong norms to assist other family members. In addition, they discussed "temporal constraints" that further disrupt the efforts to return to a normal routine. For example, attempts to repair or clean one's home, find new housing, search for a job, and travel further for a job all prevent victims from quickly returning to their pre-disaster rhythm of life.

A practical question often asked is, "How much time does it take to recover from a disaster?" Although some may toss around certain figures in weeks, month, or even years, that is not the real question to ask. Rather, recovery appears to have a specific sequence or processes of events that must occur. Depending on the case or situation, recovery can literally last from a few weeks to years. For example, Kates and Pijawka (1977) discussed not the time of overall recovery, but the pace of recovery. They devised a "period of response" with four stages: emergency, restoration, reconstruction I and reconstruction II. Simply, for recovery to begin and end, these stages must occur in this order (while also noting that some overlap will occur between each stage). Drawing upon four disasters (1906 San Francisco Earthquake, 1964 Alaskan Earthquake, 1972 Nicaragua Earthquake, 1972 Rapid City Flood), they made some relevant observations regarding the pace of recovery (and by implication the response). The authors noted that the time each phase takes is in part contingent upon how large the disaster is, but other factors do intervene. Specifically, Kates and Pijawka (1977, p. 20-21) stated:

> Reconstruction for functional replacement will be 100 times the emergency period – for most disasters it takes between two and eight years. Monumental commemorative, betterment, or development construction might lead to a doubling of the required time. It is not entirely clear why this is so, except that the length of the emergency period serves

> as both a measure the magnitude of damage and the potential social response.

By implication, their data suggests that the life cycle of disaster has further embedded within it, its own "rhythm."

Although a disaster interrupts the rhythm of life, what occurs when and after disaster strikes has its own rhythm. As noted above, Kates and Pijawka (1977) showed this notion associated to recovery. Quarantelli (1982) observed these patterns (i.e., emergency shelter, temporary shelter, temporary housing, permanent housing) regarding the different types of shelter and housing patters that cut across the response and recovery phases. Studies by Bolin (1982) and Phillips (1993) documented these general sheltering and housing patterns during other disasters, and that these stages or phases cut across what we would call impact and post-impact (or response and recovery) phases. In addition, these studies also suggested that different groups of people, based upon such factors as class or ethnicity, move through these categories at different rates of time. In short, the process of sheltering and housing has its own life cycle and these cycles exist within the broader context of recovery, which in turn exists with the broader cycle of the four phases of disaster. I find it quite suggestive that the phases of sheltering and housing cut across the impact and post-impact (or response and recovery) categories. Perhaps other sub-categories may exist within (or across) the impact and response categories that we have not yet uncovered. Or, even consider the notion of "warning," that begins during the end of the pre-impact phase in some cases (e.g., hurricanes, tornadoes), while in other circumstances does not begin until just after the actual impact (e.g., earthquakes, explosions). That disasters may have their own life cycle, and that they may then move back to a "pre-disaster" rhythm, leads to the next section of this paper.

Returning to "Normal"

Eventually, almost all communities recover from disaster. Members of communities orient their tasks and activities toward getting back to a (new) normal. Below, I discuss two processes that assist with the process toward normal—entrainment and disaster anniversary events.

Entrainment A term borrowed originally from the and still salient within the biological sciences, entrainment involves different entities getting their own particular rhythms in synch. In biology, entrainment occurs when "one cyclic process becomes captured by, and set to oscillate in rhythm with, another process" (McGrath and Kelly 1986, p. 80). The authors use the example of jet lag, and how the body's cells and functions get out of synch with the new time zone, but then slowly adjust.

Generally, scholars have used entrainment in microbiology, animal behavior, and even individual human patterns of behavior getting synchronized again. However, it

appears that except for McGrath, scholars have not focused upon entrainment regarding broader human social behavior. Let me describe how social entrainment may help us understand the process of returning to pre-event patterns. Various social units (e.g., individuals, groups, communities) all have different rhythms. These rhythms can be social (e.g., work, rest, regeneration) or biological (e.g., birth, maturation, puberty, etc.), ranging from micro (e.g. cellular) to macro (e.g., community yearly cycles). Some event can last for just a few seconds, to a month, if not longer. When two units are together, key rhythms often synchronize with each other. One social example is communication patterns. A key part of entrainment is that these social rhythms or cycles can be disrupted. At a micro level this may include, talking, motor capabilities, gaze and body movements. At the macro level, this could be how social systems stay in synch with other systems. As a result, the rhythm or cycle for that event becomes disrupted, and an attempt to return to a rhythm occurs. What is of interest here, is the idea that an "occasion" can disrupt or jolt the system, knocking it out of synchronization. Afterwards, the system attempts to return a cycle or pattern similar to earlier ones (Hall 1983; McGrath and Kelly 1986). Certainly, these illustrations could present a wide range of conceptual and empirical areas of exploration. However, taking such an approach comes with a warning. Early attempts at understanding society and "social systems" first adopted a biological model. Yet, as social scientists and others discovered later, using a strict biological model presents a static and rather conservative view of human and systems behavior and should not be applied to human organized settings. Thus, if one draws upon the notion of entrainment for this line of research, one must also be aware of and avoid the strict biological metaphor.

Certainly, one can make an argument that entrainment occurs following disaster. Once recovery begins, the goal often seems to be to "get things back to normal." Such activities may include the mundane (but actually quite important) such as getting the garbage picked up on a regular basis, to businesses and schools operating on their regular pre-disaster schedule. Overall, I believe that entrainment should be used to further understand the recovery process of disaster, and be used as a means to understand when recovery is complete. One would look for the rhythm of life returning to some degree of normalcy while also coming as close as possible to the pre-disaster rhythm of life. The amount of social change from the disaster would be a comparison of "normalcy" of the rhythm and patterns of life before and after the disaster.

Disaster Anniversaries. Over the past 20 years or so, we have seen that communities often have one week, one year or even five-year "celebrations" to commemorate a disaster. Some suggest that these anniversaries reveal more than just a marking of time. Forrest (1993) argued that, although disaster anniversaries may mark the date of an event, they become important when these anniversaries create a social time perspective of disasters. During these events, people share memories and experiences. Disaster anniversaries, he shows, help to create a collective memory. Anniversaries also produce a

sense of community among members that survived the event. As a result, the past (i.e., the disaster event) may actually become redefined. Studying the five year anniversary following the Loma Prieta Earthquake, Phillips and Hutchinson-Ephraim (1995) suggested that disaster anniversaries provide a signal that it is time to "move forward" rather than staying stuck on the consequences of the disaster.

Typically, we do not see these commemorative events after five years time (obvious exceptions of course exist, especially with major events such as the 10-year anniversary September 11 terror attacks). Calendar time (i.e., the same month and day, and on some occasions the exact time of the event) marks the event, rather than how far the community has progressed in the recovery or back to normal process. Yet, such events give people time to think to what degree they have recovered, and how much further they have to go. Perhaps these disaster anniversaries are part of the entrainment process to demonstrate that the rhythm of life is headed back to normal. Disaster anniversaries force various publics to look into the past and future regarding risk, hazards, disasters, mitigation. Finally, both in its own right and within the context of disaster and time, the aspect of disaster anniversaries is a topic worth additional study.

Some Final Implications

In this paper I have shown that the application of social time and social disruption to disaster settings (i.e., pre-impact, impact, post-impact) along can provide a unique way to understand disasters. First, by integrating the ideas of event time, social time, and social disruption, we can develop a foundation for creating an empirically based continuum of everyday life/emergency, disaster, and catastrophe. An implication of this approach is that we use specific social criteria (based upon social disruption via the various time concepts) to define the event. As a result, drawing upon social time and social disruption casts a rather wide net in understanding events what we call disaster. Occasions such as tornadoes, chemical disasters or other similar events would fall under these categories, but so could political assassinations, riots, and other events. Consider Friday, November 22, 1963, in the United States. Time metaphorically stood still from early Friday afternoon (following the reports of the initial shots and the President's death) through Monday evening (with the end of the funeral). Most people sat in front of the television waiting for new bits of information. Almost all other weekend events and activities ceased. The use of social time may also give us a unique view on understanding slow moving disasters (e.g., environmental events, famines and droughts) when compared to sudden impact events. Social time and social disruption provides tools to define disaster without making assessments (i.e., good/bad) of the event.

As previously noted, the word disaster has become a "sponge concept" in that it soaks up many different meanings—from the vernacular to the scientific (Quarantelli and Dynes 1977). However, the use of clock and calendar time with social disruption takes us

beyond everyday language (e.g., disaster, hazard, tornado, flood, explosion, terrorist attack, war, riot, deaths, economic loss) and provides a means to put such occasions a continuum. Thus, we can use the "degree of social disruption" (i.e., emergency, disaster, catastrophe) as a variable to better understand the social impacts of these types of events.

Second, I believe that the concept of entrainment could open new doors for understanding post-impact behavior, or the transition from post-impact to pre-impact (or everyday) behavior. This may include how an impact "shocks" a wide array of social units (e.g., individuals, groups, families, organizations, communities, societies), how new definitions of time are used during recovery, and how these units attempt to revert back to their pre-impact patterns and rhythms of social time. Rather than using economic, demographic, familial or other measures of social change, entrainment could be a key measure in understanding social change and disaster. For example, one could determine and compare pre-impact and post-impact social time rhythms among various units of analysis to determine social change. Drawing upon such variables as age, social class, ethnicity, and gender, once could further hypothesize and analyze which groups return to their pre-impact rhythm of life.

Third, in order to capture the complete disaster process, researchers need to focus more on obtaining data during the pre-impact or "everyday life" periods. Otherwise, we cannot pinpoint the actual degree of social disruption when an event occurs, or even make an accurate comparison to determine when different groups or categories of people complete the recovery process. Asking respondents about their pre-impact patterns of behavior certainly is one step in the right direction. Yet, I believe finding existing non-obtrusive measures could yield further insight into the relationship between disaster and social time.

Drawing upon Perry and Lindell's (1986) work, one could also determine how such shocks to the system then become routinized or institutionalized—or just ignored. Although I cannot find the original citation, I remember sitting in my undergraduate collective behavior class hearing my professor (Joseph B. Perry, Jr.) describe how during World War II, London residents became used to the bombings by the Germans. After the initial series of bombings, when the air raid sirens went off, the population stopped what they were doing, went to the shelters, then remerged from the shelters, engaged in fire fighting and search and rescue work, and then went back to their other routine. Put another way, behavior that initially was new and disruptive, later became routinized and institutionalized during times of crisis.

Finally, I need to point out and address a conundrum noted at the beginning of this paper. In order to create an organized structure to present these ideas, I drew upon a rather simple set of categories to represent disaster stages (i.e., pre-impact, impact, post-impact). Yet, the use of these (or other life cycle of disaster categories) failed to provide a good analytical basis for understanding the process of time and disaster. Probably the

most salient issue is that events cross categories (or put another way, the categories are not mutually exclusive for specific events). The organization of this paper encountered this problem. Thus, as I pointed out over a decade ago (Neal 1997), it is time for us to devise a new set of categories or a new way to look at time and disasters. In short, perhaps we need to look beyond the use of "life cycle" stages. Or, using a grounded theory approach (rather than march into a research setting with a pre-existing notion of ideas and concepts), enter communities or the field asking questions about activities, priorities and having those impacted and/or participating in the disaster event provide their own notion of time and events. From such work, we could then devise empirically derived notions of social time direct from the field. Such a fresh approach possibly improves a wide range of conceptual issues in disasters and hazards. In addition, such an approach would give us insights on how disaster managers, emergency responders, and disaster victims (recognizing that these "roles" may overlap in some cases) see, use and experience time. This, in turn, could assist with a number of applied issues (e.g., warning, effective "response," priorities in "recovery") throughout the process of disaster.

Overall, I have made this broad conceptual paper on disaster and social time suggestive rather than definitive. Hopefully, I have successfully sensitized those in the field of disasters, hazards and risk to consider including a wide array of social time issues in their analysis. Previously, scholars have generally ignored any notion of time. Now, we need to make *explicit* our use of time in understanding disaster. Such an application, I believe, will give us a much deeper understanding on defining disaster, how and why such events unfold, and how various social entities attempt to return to normal after the event. Finally, the use of social time in disaster can provide sociologists a deeper look into understanding key theoretical issues related to social order, social change and social emergence, along with voluntaristic versus deterministic patterns of behavior among various units of analysis.

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Negotiations of Acknowledgement Among Middle Class Residents: An Analysis of Post Disaster Interactions and Performance in a Danish Context

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This article presents an analysis of communication processes between residents, between residents and people in the broader societal context, as well as of media coverage of a fireworks disaster in a Danish suburb. It demonstrates how residents (all members of the Danish middle class) were able to have their situation—their affectedness—acknowledged in interactions with others and gain considerable attention immediately after the accident. In addition, it demonstrates how the initial acknowledgement decreased over time. In this case, the axes of differentiation did not relate to questions of gender, ethnicity, class or other social categories normally recognized as influential in case of disasters. Since the population in the area was very homogenous, the axis of differentiation was instead linked to the social category of affectedness, and a hierarchy of affectedness was identified within the population.

Keywords: Post disaster communication, axes of differentiation, performance theory, media, Danish middle class.

Introduction

This paper is based on an analysis carried out among residents in a small Danish suburb of Kolding that experienced sudden, drastic changes in their daily lives when a local fireworks warehouse exploded in 2004. Since the affected residents are fairly homogenous in regard to class, income, sexual orientation and ethnicity, the case provides a good opportunity to investigate processes of differentiation beyond structural and macro-sociological conditions and differences. The application of performance theory, and working with interactions from the viewpoint of those affected by a disaster, takes its departure in micro-sociological processes and will touch on the issue of recognition of context, how people whose everyday lives have been highly affected by an incident are met by others and how they experience their own context. It will be argued

that people are held accountable for their performance, as well as holding themselves accountable.

This article argues that research on disaster communication can benefit from employing a performance theoretical approach to increase understanding of certain commonly occurring processes in the aftermath of a disaster. Specifically, the concept of "affectedness" will be presented to serve as an analytical approach to understanding the interactions and communication processes in a social field affected by a disaster. Focusing on the dynamic processes of differentiation that can be identified after a disaster, this article addresses the question of how attention is given immediately by the media and the outside world in some disasters but not others, and to eventually decrease even though the situation of those affected has not truly changed. The process of comparing and contrasting different disasters is one of the processes identified in the aftermath of a disaster as well. The analysis examines how people affected by a disaster respond to their situation in the aftermath of the disaster, how others interact with them personally and what the media coverage is like.

During the course of the event, the people affected initially experienced an all-encompassing focus on their situation, an outpouring of sympathy and an acknowledgement of their situation from outside the area—from family members, authorities, politicians, the media, and the public in general. Interest waned after a short period though. The character of the interest changed not due to the fact that the context changed completely, but because the social field outside the area began to define the context differently than the residents themselves did.

The Case

As in other studies, this one builds on the assumption that processes defining the severity and consequences of an event are subject to dynamic negotiations, discussions, and even dispute in society (Alexander 1997; Hewitt 1997; Oliver-Smith 1996). Such discussions are found in literature on mass emergencies and disasters as well, where attempts have been made to define what types of events have the necessary traits to legitimately be called disasters. For example, the disaster literature addresses the issue of whether the label is exclusively linked to natural hazards, or whether it also includes technological hazards, terrorism, war etc. (Heelsloot and Ruitenberg 2004; Lagedec 1982; Mileti and Fitzpatrick 1993; Peek and Sutton 2003; Quarantelli 1993; 2005; Sattler 2003). Another aspect examined in the literature is whether the number of casualties can earn an event the label of disaster (Kreps 1998). The character of the hazard agent is also an issue of extensive debate (Blaikie et al. 1994) that involves questioning whether the agent causing the crisis is relevant. Finally, how the incident is dealt with after the response phase is also a topic of discussion (Oliver-Smith 1996).

The case studied in this article involves a fireworks warehouse exploding in a residential area in a small suburb of the city of Kolding, Denmark, in November 2004 and can generally be labelled as a technological accident with a sudden onset, but few casualties. The warehouse was subject to the requirements of the European Union Seveso II Directive, meaning that it was defined as a high risk plant. In 2000, an expansion in storage capacity at the warehouse coincided with the occurrence of a severe disaster in Enscheede, Holland, caused by a fire in a fireworks factory. The Dutch incident caused a number of citizens living close to the warehouse in Kolding to complain about the expansion and question the placement of a fireworks warehouse in the middle of a residential neighbourhood, but the local politicians and authorities failed to heed the complaints. A container fire caused an explosion in the warehouse where 1,200 tons of fireworks—roughly the equivalent of 300 tons of net explosives—were stored. One fire fighter was killed and several others injured during the operation. An efficient evacuation in the hours before the explosion is one reason for the notably low number of casualties. In spite of a huge operation to intervene, the largest on Danish soil since World War II, more than ten houses burned to the ground and approximately 350 houses were more or less severely damaged.

This paper argues that massive material destruction is not the only feature defining this disaster. First, there was the substantial rebuilding that took place due to the colossal destruction of the neighbourhood. Second, there was disruption of normal everyday life for even more people. For some families, the rebuilding and the re-housing extended beyond a year after the accident. In addition, efforts made to discover the cause of the explosion were influenced by a prolonged debate that also shed light on the role a number of politicians and authorities played in the incident. Several evaluations were carried out to identify and place responsibility for the disaster. Finally, politicians, the authorities, the media and local residents were highly focused on the psychological reactions of the affected residents and the personnel involved in the operation in an effort to avoid psychological trauma and other long-term consequences.

The case analysis undertaken shows that the people affected by the fireworks accident defined the event as a disaster, a conclusion broadly acknowledged by the authorities and the media as well. Consequently, the accident can be defined as a disaster (Buckle 2005; Rosenthal 1998). Instead of pursuing Krep's (1998) approach and discussing whether the incident was a disaster or whether it simply had the potential to be a disaster, I follow Alexander (1997) and Dombrowsky (1998), who question the benefit of working with absolute definitions that differentiate between disasters and other events. I also draw on Fordham (1998) by arguing that processes of differentiation should be analysed in both the developed and developing world as well as in regions capable of managing large-scale calamities as well as in areas with less structured emergency management. Finally this study departs as well on David's (2010) argument that processes of "studying up" and including a broad range of class and resource settings are needed to get a more

nuanced understanding of the importance of axes of differentiation revealed or reinforced by disasters.

Theoretical Framework

Although this article suggests a new focus of analysis in studies of post-disaster communication, it is inspired by two existing research traditions in the disaster literature. One, the vulnerability approach, is represented by Alexander (1997), Blaikie et al. (1994), Cutter (1996), Fordham and Ketteridge (1998), Hewitt (1997) and Phillips et al. (2010). These authors have sought to comprehend the macro-sociological question of why some societies or particular social groups such as children, women, the deprived, ethnic minorities and illegal immigrants are more vulnerable, and not just physically, than others in the event of a disaster (see Zahran et al. 2008 for an overview). Focus on this area is vital since it can help to raise awareness about the groups of people most exposed in the event of a disaster. The other approach addresses the question of how media contribute to setting the public agenda about disasters in terms of determining which victims are worthy of attention and how to show compassion (e.g., Chouliaraki 2006; Pantti 2009; Robinson 2008). Furthermore, this research perspective focuses on the ways in which the media represent worthy versus unworthy victims and also the media's ability to set an agenda that includes some incidents and excludes others.

The article proffers a theoretical framework that focuses on interactions that allow for the inclusion of perspectives not covered by the two other research traditions just described. This alternative analytical approach aims at introducing ways to understand principles and axes of differentiation other than those of gender, class, ethnicity, sexual orientation, and disabilities. Specifically, it focuses on the micro-sociological level, taking into account the dynamics of local communication processes that influence who is acknowledged and for which reasons, though it also offers conclusions regarding processes on a more macro-sociological level (Goffman 1959; Heritage 1984; West and Fenstermaker 1995; West and Zimmerman 1987). This framework is centred on interactions primarily diverges from the other traditions in two ways. First, it differs from previous work on vulnerability since it does not address the unequal distribution of resources (e.g., Fordham 1998; Hewitt 1997) or examine the structural disparity present in any society (Cutter 2005). The dominant literature on disaster vulnerability understands that people bring their vulnerability into a disaster qua their race, ethnicity, class, gender, sexual orientation, disability and the like. Second, the framework covering interactions and performance applied in this article offers a perspective on the media's that goes beyond solely analysing media texts (Chouliaraki 2006; Pantti 2009; Tester 2001). Overall, in the context of this paper, this approach predominantly concerns the media's impact on the people affected by a disaster, how the media allow them to understand their own situation, and their experience of the ways compassion is meted out.

A pivotal argument in this article is that the local context has to be considered in an analysis of the distribution of acknowledgement after a disaster. That is , the analysis has to be *situated* (West and Zimmerman 1995, p. 23). The population in the case study presented here, in contrast to other cases, is largely defined by a high degree of financial equality and a fair distribution of resources. The middle class neighbourhood struck by the explosions was also homogeneous in other characteristics such as ethnicity. Thus, the degree of equality and homogeneity in the population provides a solid basis for investigating communicative and performative differentiations as well as processes of in- and exclusion beyond structural inequality.

The foundation for the analysis undertaken in this article is the theoretical work of West and Zimmerman (1987), West and Fenstermaker (1995) and Butler (2004). In this performance theoretical approach, which derives from cultural sociology, one of the main arguments is that, as people interact and communicate, they are held accountable for their actions and their performance by others while simultaneously holding themselves accountable for their own actions and performance. That is, members of a society regularly evaluate their own performance and that of others, regardless of whether there is a disaster. The texts by the aforementioned authors chiefly look at accountability in relation to the social category "gender", where they approach gender as a social category, something that is done or performed, not as an essential trait of a person. This is an approach that also has been applied in disaster research by Fothergill (2004, p. 15). The key idea is that people are held accountable for their performance in a number of other social categories such as the ways they express their identification with a certain racial or ethnic group or their performance in a role such as a police officer, parent, journalist or other categories that serve as axes of differentiation (Appelros 2005; Krekula, Närvänen and Näsman 2005; Martin and Jurik 1996).

The analysis argues that certain expectations are established for people affected by a disaster, as will be demonstrated in the Danish fireworks incident. People are held responsible for their performance of what can be called the social category of *affectedness* after the event; they also hold themselves accountable for their own performance of this category. Affectedness is not an omnirelevant category as is the case with gender (West and Fenstermaker 1995, p. 25). Instead, it is a situated, post-disaster category in Kolding. The act of holding someone else or oneself accountable for an appropriate performance of the category of affectedness allows the identification of significant processes of differentiation, specifically the distribution of acknowledgement. Identifying the distribution of acknowledgement is another way to understand the processes set in motion in the aftermath of a disaster regarding how some people receive an abundance of symbolic privileges in terms of acknowledgement and others do not. It provides insight as well into how this distribution is subsequently dealt with by people struck by a disaster. The point is that gaining status in any social category is achieved through a dynamic process in interaction with others (West and Zimmerman 1987; West

and Fenstermaker 1995; Butler 2004). Consequently, using a performance theoretical approach provides what the concept of vulnerability is less capable of—examining interactions after a disaster by considering local dynamics and the constant change in definitions in order to understand the distribution of attention and symbolic acknowledgement given to people affected by that disaster.

Other researchers have previously dealt with some of these issues. In a discussion of theories of modernity, Edelstein (2000) has approached the relationship between people affected by a technological disaster and those outside who have not experienced the same calamities. Kroll-Smith and Couch (1990) show the mutual evaluations of citizens in between in a town threatened by a technological disaster, whereas Bos, Ullberg, and 't Hart (2005) analyse how different victim communities are more or less able to work for remembrance of disasters and the mourning of those who lost their lives. It is argued that people have to be articulated in order to keep the public agenda focused on the event, the grievances, and the questions that remain unanswered (p. 22). Although these studies are based on other theoretical traditions than the one employed here, they present relevant findings since they touch on the question of distribution of acknowledgement in a post-disaster period.

It is widely recognised that the media play a crucial role in the process of defining an incident, as well as contribute to the distribution of acknowledgement and engage others to evaluate actors' performances (Chouliaraki 2006*; Pantti 2009; Tester 2001)*. This article argues that the media contribute to defining the parameters of the social field affected by a disaster and are co-producers of meaning. Hence, in contrast to research arguing that the media have the power to *define* the situation, it will be argued that there is a complex interplay between media coverage and the interactions in the field that delineates the situation. Nonetheless, the media admittedly have a central, though not exclusive, position in the social field and influence the definitions that arise in a disaster (*Höijer 2004*). The theoretical framework in this study builds on the assumption that the local and situated accomplishments of social categories happens in interplay with the institutional arrangements (West and Zimmerman 1987, p. 146). A concluding section of this article will address this notion and argue that the media connect the micro-and macro-sociological processes.

Methods

I conducted a comprehensive qualitative study in the Kolding area that began two weeks after the incident occurred and lasted seven and a half months. The findings presented in this article stem from qualitative in-depth interviews with fifteen residents living in ten different households affected by the accident to varying degrees. I interviewed both husbands and wives in five households. In the other five households I interviewed only one adult; two of those adults were single, whereas only one adult had

time to participate in an interview in the other three households. Altogether, eight women and seven men from the neighborhood are represented in this article. Five were in their thirties, two in their forties, one in his fifties, two in their sixties and five in their seventies. The neighborhood was partly dominated by the first generation of residents who were in their seventies and partly by younger families who were second generation residents. The homes of these interviewees are located within one kilometre of the warehouse and were all either totally destroyed or damaged by the explosions that took place. Some residents had remained in their homes when the interviews took place, whereas others had been temporarily rehoused.

During the first weeks after the accident, I met a woman from the disaster struck area and asked her if I could talk to her for my research. She didn't feel up to participating in an interview at the time, though she said she would like to help me to get in contact with people from the area. She became my "sponsor" (Hammersley and Atkinson 1993) by putting me in contact with the first five households, an approach that can be categorized as a "sampling of convenience" (Trainor et al. 2006). The interviewees in these five households all connected me to yet another household, an approach to be characterized as snowball-sampling (ibid.).

There is no available socio-economic analysis of the residents living in the area struck by the explosions. Based upon interviews with officials at the municipality, I estimate that the residents have an average income for Danes and information in the qualitative interviews suggests that this is the case for the interviewees as well. All of the interviewees except one owned their homes. Some of the interviewees had post-secondary education and, not including those who had retired, all were employed at the time of the accident. The residents in the area held economic and symbolic capital to such a degree that they can be characterized as belonging to the middle-class (Bourdieu 1984; 1998). There were no differences in ethnicity, since no ethnic minorities lived in the area.

I interviewed seven police officers, four of them in senior positions, as well as four senior administration officials from the municipality of Kolding. Ten men and one woman represent the authorities in this article. They were all involved in the emergency management during and after the accident. Due to the goodwill of the authorities, I was permitted to interview the officials involved in the operation.

One of the central aims of the interviews was to provide interviewees with a forum to offer representations of their experiences and their situation (Gubrium and Holstein 1997). The interviews were not designed to get interviewees to reveal their inner feelings or to assess whether they were traumatised or would later develop post-traumatic stress disorder (*LaJoie, Sprang, and McKinney 2010; Stimpson 2005*). The purpose was to record their accounts of what happened. It should be noted that "revealing feelings" and "representations" of feelings are in no way equivalent (Gubrium and Holstein 1997, p. 57 ff.). The interviewer in a qualitative interview is often seen as a co-producer of the interview (Holstein and Gubrium 2003), since the interview situation in itself can be

viewed as an acknowledgement of people's situations (*Killian 2002*). The interviews conducted in this case study were designed not to question the interviewees' representations of affectedness, but to give them an opportunity to describe their experiences. In this way, I contributed to the representations of affectedness by creating a sense of recognition of the interviewees' context.

In addition to the qualitative interviews, I analysed the media coverage from the day after the accident, 4 November 2004 through the next eight months until 30 June 2005. This period is nearly equivalent to the amount of time spent carrying out fieldwork and has provided the opportunity to discuss, draw parallels, and identify discrepancies between the fieldwork analyses and the media coverage. Moreover, it also was possible to identify the correspondence between local residents' understandings of the disaster and what was published in the media.

The media coverage analysed is from two Danish newspapers, *Jydske Vestkysten*, a regional paper, and *Jyllands Posten,* a national paper. I searched the Danish database Infomedia, which gathers all Danish media texts and found 499 media texts that contained either the words "Johnsen", "Seest", "fyrværkeri", or "eksplosion" (the name of the warehouse, the name of the suburb, and the Danish words for fireworks and explosion, respectively). Of these 499 texts, 211 contained either representations of residents, accounts concerning the residents' situations, or interviews with residents. The texts include op-eds, editorials, letters to the editor, columns, commentaries, news reports and articles.

Phillips argues that qualitative research can offer new perspectives on disasters since it is grounded in peoples' experience (2002, p. 203). The analysis presented in this article is a product of an abductive process of analysis (Blaikie 1993) where the theoretical framework has informed the reading of the empirical material and vice versa. The data produced showed signs of differentiation processes in the area but it did not concern class, ethnicity, and gender to the degree shown in previous studies. Due to this, new research questions emerged (Phillips 2002, p. 203). Thus the questions arose "how is acknowledgement distributed?" and "how do the axes of differentiation occur when differentiation concerning categories such as gender, class and ethnicity is not that dominant in an area?".

Analysis

Accomplishment of the Social Category "Affectedness"

In the case of the Kolding fireworks explosion and other incidents, disasters and the changes in conditions they cause, affect interactions in the field. After the Kolding explosions, the affected residents were no longer expected to express themselves and interact as they had before (Andersen 2008). They interacted and expressed themselves in

new ways due to their radically changed situation; they expected themselves to express that they had experienced a traumatizing accident and suffered from a number of losses. The outside world also expected them to express their experience in some way—not just one way but several ways (West and Fenstermaker 1995). Disasters call for new expressions that are not necessarily familiar, given that people acquainted with disasters are more likely to have experienced natural hazards rather than technological ones because natural disasters can be *chronic* (see Alexander 1997). As a result, I suggest that the interactions can be conceptualised as dominated by a new social category, *affectedness,* that arose when the warehouse exploded (Andersen 2008).

The analysis below is divided into four parts. First, it touches on the communication processes in the local area and how the category of affectedness became central in the interactions during the initial period after the explosions. This was a time when everyone was working to conceptualise the disaster and make sense of the residents' situations in order to distribute appropriate acknowledgement. Second, the analysis shows how the initial acknowledgement and recognition of people's situation changed as the triggering event—the explosions—receded into the past. Finally, the analysis shows how this particular accident, and the affectedness of the residents, was put into perspective and evaluated in relation to a number of other disasters in order to make sense of the situation.

Initially, getting acquainted with the social category of affectedness was a process for the residents affected by the explosions, as was finding out which expressions would be acknowledged as appropriate after having experienced a devastating accident and living in a damaged neighbourhood. Although the performance of affectedness was accomplished as the residents interacted in this new, alien situation, they found out what to express and how to express it by interacting with each other and with people living elsewhere, who also contributed to the residents' efforts to find out how to approach the new and unfamiliar category. In the course of their interactions, residents discovered what was acknowledged, how to perform in an appropriate manner and whose performances were considered either appropriate or inappropriate. They became acquainted with evaluating interactions in the local area and also began holding each other accountable in an ongoing process (*West and Fenstermaker 1995; West and Zimmerman 1987*).

During the first five days after the explosions, residents were denied access to their homes so the authorities could investigate the area and secure it from further damage as well as assess the state of the homes that were not totally destroyed. During this time, residents met in a local schoolyard several times a day to receive news about the state of their homes. A woman in her forties describes how the residents at these meetings were aware of each other's' expressions:

> the police officer told us that none of the people in our driveway were able to move into their homes … my neighbours and I yelled and wept … well, I don't know exactly why I wept and moaned like that.

The response of yelling and mourning were found to be appropriate in the situation, though this was only one out of many forms of expression evaluated in the close interactions at the local school that served as a convenient opportunity for the residents to navigate how to perform in such an unfamiliar situation.

One key aspect of what happened was that people from outside the neighbourhood also contributed to production of the social category. Due to the fact that the residents were kept outside the area for several days, there was close contact on a number of matters between the residents and representatives from the authorities. This contact allowed residents the opportunity to have their expressions of affectedness acknowledged and the definition of their situation as terrible was established. The interviews are dominated by accounts of the ways in which the authorities showed their care and concern for the residents but, particularly, how the police treated people. Senior police officers and municipal officials described how they had decided to carry out an ethical strategy to be caring towards the residents in the days after the explosion. The police saw themselves as playing a role in order to "protect and create a feeling of safety and security" among people in the destroyed neighbourhood. Through these acts the police contributed to the accomplishment of the category of affectedness by expressing that the incident was devastating and that the residents were indeed in a situation where they needed care and compassion.

A woman in her thirties describes how a senior police officer, "showed understanding and was so caring". She also explained that the same officer was overwhelmed with emotion when describing the miserable state of their homes to residents. The police acknowledged the residents and their expressions of grief, anger, fear, worry and frustration. Consequently, the police, as well as the FRS and the municipal officials played a central role in the accomplishment of the category of affectedness, since they expected the residents to show how affected they were.

The journalists covering the accident for the Danish media engaged with people in the same way by reassuring residents that they had been put into a devastating situation. Acknowledgement from people outside the area that the residents' situation was exceedingly difficult, and the articulation of the need for help and support expressed in the contact and interaction between residents and people from outside the area, served to establish the social category in addition to being appreciated by the residents.

Previous studies point both in the direction of disaster response being militarized in case of Hurricane Katrina (Tierney et al. 2006) and in the direction of caring officials (Linenthal 2001; Wachendorf 2004) and media contributing to the acknowledgement of victims in a somewhat parallel situation (Bos et al. 2005). The question is whether the

level of conflict or care depends on institutional and macro sociological traits in a society, or if the interactions between officials and the media on the one side and people struck by an incident on the other side should be explained with reference to the local context and circumstances.

The people directly affected by the explosions experienced identical interactions not only with family members, friends, colleagues, and local authorities, but also with people from Danish institution with whom they were less acquainted, such as representatives from the state of Denmark, the Queen of Denmark, and several ministers. In addition, several non-local private charity initiatives—organised online and promoted via the media—provided goods, clothing, furniture, accommodations, money etc. to those in the affected area. Due to the fact that Denmark has a low level of charitable giving on a national level, the effort to assist was a unique sign of recognition of the people of Kolding for what they had been through.

The aforementioned groups undertook an assessment of how residents expressed themselves. This assessment found the reactions to be appropriate in the context of a damaged home and thus took the shocking experience into consideration. As a result, aid was offered in a large variety of ways that ranged from practical assistance such as housing to compassionately listening to residents express feelings of grief, anger and exhaustion. Furthermore, the media was a key player in evaluating the residents' situation and how they expressed themselves. The incident was covered intensively in the first weeks after it had occurred. There were news stories on the radio and television as well as articles and op-eds in newspapers in which people's doubts about the future and their frustrations about how their protests against expanding the warehouse went unheeded. News items also addressed the loss of financial worth of residents' possessions, their loss of possessions with symbolic value, whether losses would be covered, and their reactions to the violent experience and possible traumatisation. Local and national politicians also acknowledged the residents' difficult context, promising to provide help and support as well as to take action to prevent similar accidents from happening again. Compassion was expressed (Tester 2001) and the residents were portrayed as worthy victims (Höijer 2004; Pantti 2009). The broad variety of issues covered in the media did not convey whether some aspects of the situation were easier to recognise and focus on than others, especially to people not directly affected, or if it was simply the situation as a whole that was recognised.

From Agreement to Disagreement

One important assumption in the writings on social categories and accountability in relation to the performance of categories is that expectations towards a social category are not static. Categories are dynamic in the sense that the context always is taken into consideration when someone's performance is evaluated. As a result, this means that if

the *identification* of the context changes, expectations about people's expressions change as well (McCall 2005; West and Fenstermaker 1995). The context will therefore always be taken into consideration when people are held accountable for their performance of affectedness and other categories. Analysis of the communication processes in Kolding shows that, over time, an observable lack of recognition for the context is identifiable and the evaluation of expressions undergoes a change. The interviewees tell how interactions with people from outside the area changed to some degree since the affectedness had to be negotiated to a larger extent than was the case in the initial phase. The residents experienced a shift in their contacts with others.

One of the central criteria for the commencement of dis-acknowledging expressions of affectedness is a change that leads to a decline in the recognition of people's contexts. Initially, agreement was easily reached about what the reasons were for expressing affectedness. The devastating situation was mainly defined by issues such as the potential of the explosions to have caused a much greater number of casualties and the destruction of peoples' possessions, as well as the authorities failure to heed complaints by neighbours. Some interviewees explained that they were later held accountable for contexts they could not recognise at all. For example, some people from outside the area believed that the tragedy was manageable because of the low number of casualties and because the rebuilding had begun. From the local residents' point of view, this description of the context failed to include the larger picture. One woman in her thirties explained "Every time you talked to someone, it was like, 'You're lucky that you're alive! That's so wonderful'. And stuff like that. And I remember thinking, 'I didn't feel lucky. It didn't feel like I was lucky at all'".

In interactions with people from outside the area, people from the neighbourhood hit by the explosion also experienced being positioned as gaining financially from the incident since insurance companies were able to cover the expense of rebuilding. A man in his forties quoted the remarks of a colleague, who said to him "You must have earned a fortune from this". However, although the interviewee had a new home instead of the old damaged one, he did not feel that he had won out financially. The colleague's comments were a source of frustration because of the immense number of symbolic losses suffered. Another example of the change in the recognition of context is illustrated in the following quote, in which a woman in her thirties cites a visiting relative from another town who said "Now there is no reason for people in this neighbourhood to cry any more. You've either got a new house or restored the old one—so stop complaining".

Engaging her relative in a discussion to negotiate a different evaluation of the story, she argued that she would gladly take back her old home with poorly insulated windows if it meant that that the explosions had never happened. She would do anything to get her old life back. Such efforts to negotiate the evaluation of stories after a calamity are also presented by Fordham (1998).

For the residents affected by the explosion, their perceptions of fundamental changes in their ordinary contexts lasted for a long time, while outsiders quickly began to question the terribleness and severity of the situation. This difference in recognition of the context led to negotiations about affectedness. As was the case during the initial period after the accident, the evaluations that stemmed from interpersonal contact were reflected in the evaluations presented in the media. Nohrstedt (2007) argues that in- and exclusions of issues discussed by the public are backed by the media since the media create "ideological horizons". Therefore, an analysis of the mediated discourses provides a good opportunity for a co-investigation of the dynamics in the social field.

The media texts show that after the initial phase, the amount of news coverage and the number of texts on the accident decreased, though recognition of a number of elements in the residents' contexts were still on the agenda. Op-eds, however, show a significant and apparent questioning the residents' context. A few days after the accident, a letter to the editor in the regional paper states:

> What happened in Kolding is tragic. I feel for the people affected by this, especially for the relatives of the fire fighter who was killed. But now we've heard enough about it (…) It's been almost 8 days, so we don't have to talk about it anymore. At least not those of us not directly affected. (*Jydske Vestkysten*, 17 November 2004)

This letter to the editor argues that acknowledgement of affectedness can only go on for a limited period, a week in this case, for the people affected by a technological accident of the magnitude experienced in Kolding.

Another letter to the editor in the same newspaper states:

> I feel sorry for the people whose homes have been destroyed by the large explosion. Money, clothing, accommodations and assistance have been offered and sent from all over the country to the families in Kolding that were hit by this catastrophe. And then I read in my paper about a couple frustrated about not being able to move on with their lives (…) How can you write something like that? They ought to be happy that they haven't lost their children, wife or husband. In this case I am thinking of the person most affected, the fire fighter who died to save you. If anyone feels bad and terrible, then it is his relatives, his children and his wife. (*Jydske Vestkysten*, 20 November 2004)

This letter suggests that complaints and expressions of frustration are inappropriate when people affected by the incident have not lost a family member. Compared with the loss of life, the symbolic loss of a home and the resulting insecurity are not enough to

merit compassion or make people worthy victims (Pantti 2009; Robinson 2008; Chouliaraki 2007). People are held accountable for their performance of affectedness in relation to the situated context and it seems that a part of the struggle relates to disagreements about the situated context. The question then arises as to what is the actual situation of the residents.

For many people, affectedness still rests on doubts about the future, futile protests against expanding the warehouse, loss of possessions of financial value, the loss of possessions with symbolic values, the question of whether losses will be covered, reactions to the severity of the experience, traumatisation and the children's situation. From the residents' point of view, the category of affectedness involves many more aspects that are not widely accepted, or at least, not accepted in ways that create continuous acknowledgement of the expressions of affectedness.

Notably, the overall picture of the distribution of attention and acknowledgement is a blurred one. In the months after the incident the authorities withdrew when their activities ended, though a group of psychologists continued the treatment of trauma. Interactions involving care, acknowledgement and recognition of affectedness by *family members and friends continued. T*he people affected by the incident were met simultaneously by disinterest and distance as well as interest and involvement, contradictory evaluations that influenced their evaluation of themselves.

Analysis of the Danish incident shows that these dynamics appeared in the social field immediately after the incident, which means that the residents had to confront conflicting evaluations of their situations. After a while, only certain sources acknowledged the residents' situation. The universal agreement on rendering attention and care for people and a way of conceptualising the situation that everyone can agree on undergoes negotiation after a brief amount of time before the agreement rapidly turns into disagreement. One of the central issues of the debate is the issue of what context or situated practice must be taken into account when evaluating the people's expressions of affectedness (*McCall 2005*).

Hierarchy of Affectedness

Disasters lead, as also shown by Linenthal (2001) and Larabee (2000), to discussions of whom to privilege and thereby to processes of exclusion. The last part of the Kolding analysis shows how a hierarchy of affectedness is constructed in interactions within the group of people in the local area, in interactions between those from the area and those outside the area, as well as in the media coverage. The hierarchy is based on the question of who is worthy of being included and takes positions on whom to exclude. Both the interviews and the media negotiate a local hierarchy and discuss, for example, the status of the accident in comparison with other disasters. The hierarchy that I identify in the empirical material resembles Butler's (2004) hierarchy of grief, which is based on

common agreements in a social field regarding the matter of what makes for a grievable life and why some lives are worth mourning and others are not. I identify similar processes of differentiation in a social field during disasters by bringing into play the notion of a *hierarchy of affectedness* (Andersen 2008), which still refers to processes of inclusion and exclusion in an interactionistic analysis framework.

Struggles can be identified in order to position one's own affectedness in relation to others. There are accounts in the local Kolding hierarchy in which each family positions itself in relation to other families and their degree of affectedness. A number of interviewees mentioned a particular family in the area who lost three young children in a fatal fire some years prior to the firework accident. Their home had now burned to the ground again. A story in the regional newspaper (*Jydske Vestkysten*, 6 November 2004) suggested that the locals were unable to fathom the degree of this tragedy. Interviewees often referred to this family in order to put their own story into perspective. One's own affectedness is nothing compared to the misfortune of this family that even makes the interviewees' situation seem privileged. References were made to other families or households against whom the interviewees measured themselves and their situations. Families who had lost items of high symbolic and low financial value were often placed in the category of very affected. Having family photo albums spared from destruction, for example, was considered to be a major privilege.

Some of the people affected by the incident ended up questioning their position in the hierarchy. A woman in her thirties was unsure as to whether the psychological counselling being offered was also available for people in her situation. Did someone in her position and with her degree of affectedness have the right to take advantage of the counselling offered? She asked a good friend who worked at the local hospital what she thought and her friend said "You know what? There are a lot of people who haven't had experiences as bad as you have who come to see the psychologist". Ultimately, she concluded that she could also consult a psychologist but she needed help in order to evaluate her position.

The hierarchy constructed after the explosions concerns the positioning of citizens in the local area, but also involves the construction of a hierarchy that places the Kolding residents in relation to people affected by disasters elsewhere in the world. Making sense of the fireworks accident was achieved by making comparisons to previous global and historically familiar incidents. After the explosions, the accident was positioned in relation to events such as World War II, 9/11 and the 2004 South East Asia tsunami. This was the case for residents, politicians and journalists who had covered wars. Parallels that might appear peculiar to people from the outside made sense within the social field and facilitated an understanding of the gravity of the situation and the residents' affectedness.

Parallels to 9/11 appeared in a debate on the phenomenon of convergence occurring in the area. People from outside who were labelled as curious (Kendra and Wachendorf 2003) practiced a kind of convergence, showing up to get an impression of the

dimensions of the incident. When the appropriateness of doing so was discussed in the regional newspaper, the point was made that tourists in New York often visit Ground Zero to make sense of 9/11. (*Jydske Vestkysten*, 2 December 2004 and 21 November 2004).

Despite the comparisons made in the neighbourhood and backed by politicians and the media in the initial phase between the fireworks explosions and other international disasters, the hierarchy of affectedness was undergoing changes. The point is that there never will be any obvious structure defining worthy victims (*Pantti 2009*) since new disasters will occur. The context of the Kolding accident was put into perspective, for example, by the 2004 South East Asia tsunami. This international catastrophe challenged the context of the Danish incident, setting a local process in motion of negotiating the hierarchy in order to place the fireworks incident in relation to the tsunami. For some people, the tsunami played a central role in helping them understand the diminishing acknowledgement of the people in the neighborhood, both in relation to personal interactions and mediated ones. One newspaper editorial stated:

> The fire and the gigantic, fierce explosions at the fireworks warehouse aren't something you forget right away, if you were there for what has rapidly – and fairly – came to be called a disaster (…) Very few, if anyone, could have foreseen that the disaster in Kolding would end up seeming like a manageable accident within a short time span. But when it is followed by the Asian tsunami, then the proportions suddenly change. After all, with the exception of one fire fighter who died, it was primarily things of material value that disappeared in Kolding. (*Jydske Vestkysten*, 2 January 2005)

A number of the local residents agreed with the statement in this editorial. They thought that the 2004 South East Asia tsunami was much worse than the technological disaster in Denmark, when seen in relation to the context of material damage and few casualties. However, not everyone agreed. Some people negotiated the importance of keeping the Kolding accident on the agenda instead of letting the tsunami dominate everyone's attention in Denmark. One reason for the commitment to this struggle was the question of financial help for the families in Kolding who did not feel that they had received sufficient financial compensation from their insurance companies and who would have liked the government's involvement in the matter (which the Danish government refused). A male interviewee in his forties stated: "Phuket down there … that tsunami and whatever … they can send several billion in funding down there, but when something happens in their own backyard … you can't even catch their attention".

It is not an extraordinary occurrence to receive social welfare in Denmark where comprehensive forms of welfare payments are offered. Thus, asking for financial help is

not experienced as stigmatizing in the way that Fothergill (2004) showed in an U.S. context. This is only the case among few of the older interviewees in the Danish case. However, the tsunami was not solely understood as a competition about who received the most financial help. A disaster such as the tsunami brings about changes in the acknowledgement of the affectedness. In Kolding it was seen, for example, as a threat since the Danish media agenda changed significantly, just as it did in other countries (Pantti 2009). One woman interviewed stated:

> We really felt like we were being pushed out in the cold when the tsunami came between Christmas and New Year's Eve … A television programme had been made about the Kolding incident and everybody in the neighbourhood … that's what everyone was talking about. We'd really been looking forward to seeing the program and then the television station just cancelled it! They thought that the tsunami had brought enough disaster.

The interviewee sees the media agenda as important because it represents a platform from which those affected could receive not only recognition from others but also gain an opportunity to recognise themselves and their affectedness as well. Symbolic recognition also happens through the media just as it does in interpersonal interactions. Consequently, when the media coverage changed quantitatively, so did the way people experienced having their situation acknowledged.

It is of importance to note that the severity of the accident and the despair among the residents were negotiated differently in the local area. For some, it was important to have their situation acknowledged several months after the accident, whereas others understood and accepted the decrease in interest and recognition. As emphasised in other studies, incidents that are kept on the agenda and stay in the collective memory , or incidents that are placed in the top of the hierarchy of grief (Butler 2004), or that keep their place in top of the hierarchy of affectedness are the result of negotiation (Bos et al. 2005).

Discussion

The conclusion of the Danish study is that outcomes of the post-disaster interactions cannot be foreseen since a number of relations and dimensions have an influence on the negotiations, processes of negotiations, and hierarchies constructed in relation to a disaster. The analysis of the processes in the Danish disaster-struck area with middle class residents shows how people in their interactions simultaneously support each other and have conflicts while negotiating the situation, a situation that is also well described by Fordham (1998) and Fothergill (2004). Meanwhile, the widespread practice of

insurance purchase g the Danish middle class makes it difficult to identify characteristics from other studies e.g. concerning processes of stigmatization of people in need of financial help.

The Kolding study is rich in accounts of caring officials and authorities that acknowledged the residents' situation and is, in this regard, consistent with some of the findings in the existing literature on officials' supporting roles post-disaster (Linentahl 2001; Wachendorf 2004). It is worth noting, however, that contrary findings are also part of the research field, arguing that militarization, rather than care, is identified in other cases (Tierney et al. 2006). Officials and authorities can have disparate influences on post-disaster processes and their influence on in- and exclusions should therefore be taken into account as well.

The existing literature demonstrates that the media often cover disasters intensively in the initial phase followed by a decrease in coverage. In this study, I argue that it is important to understand *how* the media coverage is understood and interacts with other processes as well. The results of the Kolding study are in accordance with a basic premise in the existing research that the media play a central role regarding compassionate coverage (Chouliaraki 2006; Pantti 2009; Tester 2001) and that the media appoint those they consider to be worthy victims (Chouliaraki 200; Pantti 2009; Robinson 2008). Hence, the Kolding study concludes that more academic attention should be given to analyses of how media coverage influences interactions.

The outcome of the post-disaster communication processes regarding issues such as the acknowledgement of affectedness, principles of differentiation, and negotiation of hierarchies in a local area does not entirely depend either on interactions among residents, interactions between residents and people in the broader societal context, or media coverage. Instead there is a concurrent interplay among processes going on in, and in relation to, a disaster struck area, and a number of situated dimensions might have to be taken into account. Even though the findings from the Kolding event seem to be in line with those within the disaster research field, in which post-disaster processes of in- and exclusion are well described, the outcome of communication processes are always the result of situated conditions, since every disaster has its own distinct characteristics.

Conclusion

This analysis sheds light on the different ways situated practices are understood in a disaster as well as on how differences in context and a decrease in focus on a difficult situation for the group of people affected go hand in hand. The performance theoretical approach emphasizes the importance of recognizing context regarding the overwhelming interest and acknowledgement often given immediately to people affected by a disaster, at least in the developed world. This approach can help to shed light upon the post-disaster disagreement on the question of defining the context for people affected by that

disaster. I argue that disaster research, and research on disaster communication processes in particular, can benefit from a performance analytical approach due to its immediate focus on local processes of negotiating what expressions are deemed appropriate or inappropriate in a post-disaster period.

The Kolding explosion illustrates the theoretical assumption that, though it is the case in this study that the social category of affectedness apparently gets accomplished locally in the aftermath of the incident, it is also well nurtured and supported by society in general—including the authorities, politicians and media coverage. Interactions in the social field are the product of dynamics and definitions constructed in the encounter between the micro level and society in general. The Danish authorities acted in a caring and compassionate way towards people from the middle class in general and, since a majority of Danes belong to the middle class, they could identify themselves with the residents of the damaged neighbourhood because they were familiar with their way of living. Finally, the media held an interest in covering incidents with which readers could identify. It can be argued that this is why the local residents gained attention and acknowledgement. At the same time, the way that the disaster was dealt with in this particular case, which was broadly covered in the media, set standards in society in general. This will have an impact on disasters to come.

An additional point made in this article is that "studying up" in the research on mass emergencies and disasters creates insight that calls for new analytical frames and notions. One conclusion of this study is that even though middle class people might experience a disaster without suffering financial losses, they might suffer from symbolic losses that can be hard for others to grasp. Those who experience a shortage of symbolic acknowledgement require additional resources to gain attention. A number of people in the case studied were unable to keep the accident on the public agenda despite the fact that they belonged to the middle class and had a financial status that made it difficult to categorise them as vulnerable. It takes more; resources of a more subtle character than financial ones are required.

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Responding to Haiti's Earthquake: International Volunteers' Health Behaviors and Community Relationships

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International disaster volunteers are an important group of workers on the ground after a disaster who have not been the subject of much research. Utilizing survey data from volunteers with a non-governmental organization in Leogane, Haiti after the 12 January 2010 earthquake, this paper focuses on volunteers' characteristics, their health behaviors (i.e. protective and risky), and their interactions and relationships with their host community. The volunteer population was primarily made up of single young adults with a high level of education. They engaged in various protective health behaviors, with women more likely to use of bug repellent and sunscreen more frequently than men. The majority of volunteers believed that interactions with the host community were not significant to their work; however they believed that a strong relationship was important to the success of the relief effort. Disaster volunteer health behaviors and relationships with the host community should continue to be studied.

Keywords: Volunteers, Haiti, risk behaviors, disaster relief, protective behaviors.

Introduction

Haiti was devastated by an earthquake registering at 7.0 on the Richter scale on 12 January 2010 at 4:53 PM Pacific time. The epicenter of the earthquake was 15 miles west-southwest of Haiti's Capital, Port-Au-Prince, in the city of Leogane (U.S. Department of the Interior 2010; Millar 2010). International agencies have long been providing assistance and services to Haiti; prior to the earthquake, Haiti had more operating non-governmental organizations (NGOs) per capita than any other country in

the world. Following the earthquake, international organizations led the recovery process (Farmer 2011). NGOs and others provided rescue teams, food, health care, general relief and, in the months following the quake, assistance with rebuilding homes and infrastructure. Using a social survey, this study characterizes international volunteers that responded to the earthquake in Haiti, with a focus on their health behaviors and relationships with the host community. These themes emerged as most relevant during the first author's month-long volunteer service in Haiti with a NGO after the earthquake and relate to previous research literature, to be discussed next. Few studies have sought to examine the behavior and characteristics of international disaster volunteers; however, as the magnitude and frequency of disasters increases, we assume this population will continue to grow—especially in the developing world where international aid is central to disaster recovery.

Literature Review

Volunteer Characteristics

While the characteristics of international disaster volunteers have rarely been examined, the literature does describe volunteers more generally with regards to their age, sex, educational attainment, and previous disaster volunteer experience. Previous studies have shown volunteers (not disaster volunteers) to primarily fall between the ages of 30 to 50 (USDL 2010). Among volunteers in emergency and disaster situations the likelihood of participation drops as age increases (Rotolo and Berg 2011). Immediately following a disaster, younger adults tend to volunteer as the relief work is generally physically laborious (Wenger and James 1994). Women are more likely than men to volunteer in general; however men have a higher probability of volunteering in emergency preparedness and disaster relief work (Rotolo and Berg 2011, SDL 2010). Specific to disasters, men have been found to be more involved in search and rescue operations whereas women are more likely to be involved with supplies (Wenger and James 1994).

Socioeconomic status (SES) is positively related to volunteerism (Kanaisty and Norris 1995). Relatedly, an individual's probability of volunteering is heightened as his/her level of educational attainment rises (Plummer, Ai, Lemieux, Richardson, Dey, Taylor, Spence, and Hyun-Jun 2008; USDL 2010), although this association may relate to early life experiences, which are associated with educational attainment and volunteering (Musick and Wilson 2007). In contrast, when focusing on emergency preparedness and disaster relief volunteers, individuals with high educational attainment (i.e. college graduates and individuals with advanced degrees) are less likely to participate in volunteer efforts as compared to individuals with less than a high school diploma (Rotolo and Berg 2011). Previous experience as a volunteer generally predicts

an increased likelihood of volunteering both time and services in a disaster relief effort (Beyerlein and Sikkink 2008, Plummer et al. 2008, St. John and Fuchs 2002).

Volunteer Health Behaviors

Although attention is often directed at the health of victims of disaster (e.g. Bailey and Deshazo 2008; Chambers, Campion, Courtenay, Crozier, and New 2006), volunteers can also face health challenges, but this has been studied to a lesser degreee. Individuals who respond to natural or technological disasters are vulnerable to adverse physical and mental health effects (Perrin, DiGrande, Wheeler, Thorpe, Farfel, and Brackbill 2007), in part due to a lack of knowledge about the risks they face (Swygard and Stafford 2009). In this way, their health behaviors (i.e., protective or risky) are an important area of focus. The majority of previous research on the health of disaster volunteers has focused on mental health (e.g., Dolce and Ricciardi 2007; Perrin et al. 2007). In this paper, we instead focus on volunteers' health behaviors (i.e.,protective health measures and risky behaviors), an understudied area.

Protective Measures

It is usually necessary that volunteers take preventative health measures when traveling to disaster areas. For example, although not directly addressed in prior studies, wearing a mask is an important protective health measure when removing concrete rubble, a common activity for volunteers in Haiti post-earthquake. More generally, in tropical areas like Haiti, important protective measures include use of insect repellent, sunscreen, anti-malaria pills and gastro-intestinal medications. In one of the few studies examining the protective health behaviors of volunteers, 69% of health care professionals volunteering after Hurricane Katrina used sunscreen and 46% used insect repellent (Swygard and Stafford 2009). Although not a disaster-specific study, only 24% of American university students studying abroad in a malaria-risk region acquired anti-malaria pills and gastrointestinal medication for their trip (Hartjes, Baumann, and Henriques 2009). Seventy-one percent of workers in high malaria-risk areas with Voluntary Services Overseas (VSO), an agency that sends volunteers to address poverty in developing countries, reported that they slept under a mosquito net (Bhatta, Simkhada, van Teijlingen, and Maybin 2009). Which social groups of volunteers were more likely to engage in protective behaviors has not been previously examined.

Risky Behavior

Risky behavior has not been generally studied when looking at disaster volunteers. However, researchers have examined risk taking by volunteers in developing countries

(Dahlgren, DeRoo, Avril, Bise, and Loutan 2009) and among students studying abroad (Hartjes et al. 2009). Important risk-taking behaviors identified include unsafe sexual behavior and drug and alcohol consumption. It may be that the freedom associated with international volunteer work and the emotionally and physically challenging environment lead volunteers to engage in risky behaviors (Dahlgren et al. 2009).

Age has been identified as a key predictor of risky sexual behavior among volunteers (Bhatta et al. 2009). Aid workers from The International Committee of Red Cross (ICRC) over age 50 were 55% less likely to engage in sexually risky behavior than those younger than 49; 25% of volunteers reported sometimes or never using condoms, and 12% admitted to engaging in sexually risky behavior that they would not have engaged in at home (Dahlgren et al. 2009). Length of service was also important: Dahlgren et al. (2009) also found that individuals serving a longer volunteer term were more likely to engage in general sexual activity. Increase in tobacco and alcohol consumption is another documented risky behavior that aid workers engage in when deployed internationally. Among expatriates working with the ICRC, 14% reported an increase in alcohol consumption and 43% of smokers reported an increase in their smoking. Additionally, 10% began smoking during their missions (Dahlgren et al. 2009).

Community Interactions

The social connections between international disaster volunteers and host communities have not been examined much in previous disaster research; however, there has been research on "volunteer tourists" and their interactions with host communities (Raymond and Hall 2008; McBride, Brav, Menon, and Sherraden 2006). Research into volunteer tourism has mainly been focused on the "gap year" (year between high school and college) taken by young Europeans (Raymond and Hall 2008). Organizations advertising to gap year individuals tend to romanticise poverty, emphasize the "developing" world and the maginalized population, and further entrench the volunteers' belief in a 'them and us' ideology (Simpson 2004). In this way, volunteers embark on their service differentiating between themselves and the host community and believing that the host community is reliant upon the volunteers.

Language differences can be a barrier to interactions between host communities and international volunteers. The Westernized elite population (those most likely to speak English) are usually the individuals who interact most often with the mostly monolingual English international volunteers (Cohn and Wood 1985), contributing to a divide between the general surrounding population and the international volunteers. Apart from language barriers, international volunteers can also be spatially segregated from host communities (Raymond and Hall 2008), which contributes to the social distance between the two groups. McGehee and Santos (2005) explained that being surrounded by like-minded individuals in a group of volunteers can create a comfortable atmostphere and allow

volunteers to isolate themselves. This creates two societies for volunteers, one of international volunteers and another in which the volunteers interact with the host community.

The power differentials and inequalities that exist between host communities and international organizations are, in some cases, perpetuated by those organizations. Organizations may focus primarily on their volunteers (i.e. qualifications, education, recruitment), while neglecting host community members, which perpetuates the inequalities inherent in these relationships between people from more and less affluent countries. Despite not having previous experience or skills, international volunteers sometimes take on the roles of the teacher or supervisor of local volunteers and staff, indpendent of the skills of the local volunteers/staff (Raymond and Hall 2008), which contributes to a power differential.

Longer terms of residence in host countries for volunteers can reduce the social barriers and power differentials between volunteers and residents. Individuals who volunteer abroad semi-permanently may be more easily incorporated into the host community than those just volunteering on vacation because long-term volunteers live and worke in local conditions (Palmer 2002; Devereux 2008). This allows volunteers to understand the host community through their informal relationships and can help to facilitate more effective programs (Devereux 2008).

Given this information and the first author's experiences as a volunteer in Haiti for one month during the summer of 2010, this paper addresses the following research goals. First, we characterize the volunteers on the dimensions of age, sex, income level, educational attainment, employment status, marital status, disaster experience, and their incoming perceptions of Haiti (Research Goal [RG] 1). Second, we characterize the prevalence of protective and risky behaviors amongst these volunteers (RG 2). Third, we examine correlates of protective measures and risky behaviors (e.g., age, sex) (RG 3). Fourth, we characterize the relationships between the international volunteer and the host communities based on volunteer perceptions (RG 4). Finally, we analyze correlates of the strength of the relationships and frequency of interactions (e.g., conversing with, sharing a meal with and working with Haitians as well as playing with Haitian children) between the volunteers and members of the host community (based on the volunteers' perceptions) (RG 5).

Data and Methods

The study relies on survey data from volunteers working with a US-based NGO that began operating in Leogane, Haiti on 15 February 2010, which prefers to remain anonymous. The mission of the NGO is to connect volunteers with communities in need following disasters. Prior to the earthquake in Haiti, this organization had responded to 14 disasters, the first being the 2004 tsunami in Thailand. Since the earthquake in Haiti,

they have responded to eight additional disasters and are still in operation today. In Haiti, the primary functions of this NGO's volunteers were demolition, removal of rubble, construction of schools, and spending time with orphans; the volunteers were largely unskilled in these forms of labor. In addition, the organization conducted several other smaller, secondary projects such as gardening.

Before discussing the methodological details of the survey, we will first review some of the organization's policies and practices that likely shaped volunteers' experiences and behaviors. The NGO required that all volunteers be over the age of 18. In materials provided online to the volunteers pre-trip, the NGO suggested the following related to health—the use of masks while removing rubble and demolition, the use of anti-malarial pills, bug repellent, sunscreen, and mosquito nets, but they did not explain why these measures were important and none of these items were required for service. They did not have any policies prohibiting sexual behavior and they provided condoms to the volunteers for free. They did not allow drugs or alcohol on the base where the volunteers lived, and they enforced a 10pm curfew. Many volunteers consumed alcohol at a bar next to the base. Smoking on base was permitted, but restricted to a smoking area away from the sleeping area. The NGO did not allow Haitians not directly employed by them within the secure perimeter of the base. This meant that they permitted cooks, drivers, and translators, but not the unpaid Haitian volunteers working for the organization. When the first author was in Haiti, there were approximately a dozen Haitian staff members and 15 local volunteers (mainly young men, many of whom were in school before the earthquake) who worked alongside approximately 115 international volunteers.

In terms of data collection, an online survey through Survey Monkey, piloted with eight university students, was sent to volunteers as an item in a newsletter produced by the NGO. The 660 volunteers who were emailed the newsletter had served in Haiti with the NGO for a minimum of one week between January and December of 2010. To increase the response rate, we wanted to contact the volunteers directly though a separate set of e-mails, but the NGO was not willing to share the email addresses of their volunteers, and they would not send the survey in a email separate from the newsletter. The survey was open for four weeks beginning January 7, 2010 and volunteers were emailed the link twice, once at the opening of the survey, and once one week before it closed (it was included in a newsletter both times). Completion of the survey served as informed consent (as per Fiala, D'Abundo, and Mariano 2010). This study was approved by our university's Institutional Review Board (IRB) and the NGO.

Despite the research limitations established by the organization throughout the research process, we felt it was the optimal choice for this study. First, they were one of the largest organizations responding after the earthquake in Haiti, with over 100 international volunteers working throughout the summer of 2010. By January 2011, they has hosted 660 volunteers in Haiti. Second, they are well respected among volunteer-based NGOs and had been coordinating international disaster volunteers for six years at

the time of the quake. Third, they were willing to participate in the study. Given the exploratory nature of this project, we believe any information gained about this disaster volunteer population is important because no other study has looked at this type of population.

There were 90 individuals who responded to the survey. Assuming that every individual on the e-mail distribution list received the survey link, the response rate would be at least 16%. We assume that some of the 660 people on the list did not receive the survey, but we are unable to estimate that proportion. We do not know how many newsletters were returned to the NGO as undeliverable (the NGO denied our request to provide this information) or filtered by spam and how many volunteers never opened the emailed newsletter and therefore were never aware of the survey. Nonetheless, this conservative estimate of the response rate is comparable to previously reported internet survey response rates (Marcus et al. 2007). The length of a survey instrument is related to the response rate, and given the experimental research on response rates in e-surveys (e.g., Marcus et al. 2007); a 16% response rate would not be unexpected, based on the length of this survey (20-40 minutes).

The survey addresed several domains, including the three that are the focus here—volunteers' personal characteristics, health behaviors, and community interactions. We summarized the volunteers' responses to the survey questions about their personal characteristics and used descriptive statistics for these variables are to address RG1. We referenced the United States Department of Health and Human Services (2008) survey and United States Department of Health and Human Services (1994) survey in the construction of health behavior items to address RG 2.

RG3 through RG5 were addressed through the use of correlation matrices. Multivariate analyses were not utilized in this study because of the small sample size. For RG 3, we correlated age, sex, income, previous disaster experience, and time spent in Haiti with 1) frequency of use of bug repellent, 2) frequency of use of sunscreen, 3) use of anti-malaria pills and 4) a risky behavior factor (Cronbach's $\alpha = .59$). This factor combines the volunteers' self-reported drug use and consumption of moonshine while based in Haiti.

To address RG 4, we addressed community interactions through questions about the frequency of interactions, quality of interactions, and barriers to relationships between volunteers and the host community. In addition, we analyzed the language barrier by running a paired samples *t*-test on Creole and French language skills before arrival and after departure in Haiti. RG 5 involves computing correlations between sex, age, volunteer income, previous disaster experience and time spent in Haiti and two dependent variables: 1) interaction frequency factor (Cronbach's $\alpha = .57$), which combines the frequency of the following interactions with the host population: conversing, playing with children, working with local volunteers or community members, and sharing a meal; and 2) the volunteers' perception of the quality of their relationship with the host community

as good or poor. In addition, the survey asked several open-ended questions, several responses to which are included in the *Results* and *Discussion* sections.

Results

Volunteer Characteristics

Related to RG 1, Table 1A shows that, of those who answered the survey, 59% identified themselves as female, 59% were between the ages of 20-29, and 69% were single. The vast majority (72%) was from the US. One hundred percent of those who reported their education were high school graduates and above. Those who went to Haiti generally volunteered in their home communities (63%). However, when asked about their frequency of volunteering, nearly one-quarter reported volunteering less than once a month. Only 35% had previous disaster volunteer experience, and very few volunteers had direct experiences related to Haiti prior to arrival—only 5% reported prior travel there and only 7% had a personal connection to Haiti.

Table 1B shows that, when asked about employment history before their volunteer service in Haiti, 81% reported being employed or a full-time student, with 63% of those working more than 30 paid hours per week. The largest percentage reported an annual household income of between $10,000 and $29,999. The majority of volunteers funded their own travel to Haiti, however 37% reported receiving financial assistance. For those respondents receiving financial assistance, it came primarily from family (64.5%) and friends (58%).

Volunteer Health Behaviors

Protective Measures. In addressing RG 2, Table 2 shows that, while volunteering in Haiti, 40% reported that they did not take anti-malaria pills, with concerns about the side effects being listed as the number one reason for not taking the medication. Fifty three percent reported bringing a prescription gastro-intestinal medicine with them from home, and 5% received gastro-intestinal antibiotics while in Haiti. Although 42% of the volunteers reported bringing a mask to use while removing rubble (which involves removing collapsed building materials and can result in the inhalation of concrete dust), only 33% of them bringing a mask and actually wearing it.

Table 1A. Volunteer Characteristics.

Variable	Percentage (N)
Sex	
Female	59% (50)
Male	41% (35)
Age (in years)	
20-24	27% (23)
25-29	32% (27)
30-39	25% (21)
40-65	15% (12)
Education	
rade 12 or GED	4% (3)
Some College (or Technical School)	15% (13)
College Graduate	52%(44)
Post-Graduate (e.g., MA, PhD, MD)	29% (25)
Nationality	
United States	72% (61)
United Kingdom	9% (8)
Canada	12% (10)
Australia	2% (2)
Other	5% (4)
Marital Status	
Single	69% (58)
Cohabitating	11% (9)
Married	16% (13)
Divorced	2% (2)
Other	2% (2)
Volunteer in Home Community	
No	37% (31)
Yes	63% (52)
If yes, how often?	
Less than once a month	23% (12)
Once a month	19% (10)
Multiple times a month	29% (15)
Once a week	17% (9)
Multiple times a week	13% (7)
Previous Disaster Experience	
No	65% (55)
Yes	35%
If yes, how many times?	
0	65% (55)
1	18% (15)
2 to 3	9% (8)
4 to 5	5% (4)
6+	1% (1)
Personal ties to Haiti before volunteering	
No	93% (78)
Yes	7% (6)

Table 1B. Volunteer Employment Status and Income.

Variable	Percentage (N)
Been in Haiti Before	
No	95% (80)
Yes	5% (4)
Employed Before Haiti	
No	19% (16)
Yes (includes full-time students)	81% (67)
If yes, hours worked (does not include students)	
None	3% (2)
1 to 10	8% (5)
11 to 20	8% (5)
21 to 30	18% (12)
31 to 40	32% (22)
40+	31% (21)
Financial Assistance for Trip	
No	63% (52)
Yes	37% (31)
Volunteer Income	
Less than $1,999/year	4% (3)
$2,000-4,999	4% (3)
$5,000-9,999	10% (8)
$10,000-19,999	20% (15)
$20,000-29,999	20% (15)
$30,000-39,999	7% (5)
$40,000-49,999	5% (4)
$50,000-59,999	5% (4)
$60,000-69,999	4% (3)
$70,000-79,999	7% (5)
$80,000-89,999	4% (3)
$90,000-99,999	1% (1)
$100,000-149,999	3% (2)
$150,000+	8% (6)

Another concern when traveling to Haiti is mosquito-borne illnesses, such as malaria and dengue. Only 1% of those surveyed reported that they never used a mosquito net or tent while in Haiti, and 85% always used either a net or tent. Twenty two percent of the sample "rarely" or "never" used bug repellent, but 41% always did. Because volunteers primarily worked outside, sun exposure was a health risk—18% of those surveyed reported "rarely" or "never" applying sunscreen at least two times daily, but 39% reported "always" doing so.

In the correlation analysis (RG 3), Table 3 shows that females were more likely than males to use bug repellent more frequently (r = -.34) and to apply sunscreen more frequently (r = -.27). More international volunteer experience was associated with fewer protective behaviors. The longer volunteer were in Haiti, the less likely they were to

regularly apply sunscreen (r = -.34) and volunteers with previous disaster experience were less likely to take anti-malarial pills (r = -.27).

Table 2. Volunteer Health Behaviors.

Variable	Metric	Mean	Median	SD
Anti-malaria pill	0=No, 1=Yes	.60	1	
Brought Cipro from home	0=No, 1=Yes	.53	1	
Prescribed Cipro in Haiti	0=No, 1=Yes	.05	0	
Used Cipro in Haiti	0=No, 1=Yes	.22	0	
Removed rubble	0=No, 1=Yes	.96	1	
Wore mask	1=Never - 5=Always	1.53	1	.86
Mosquito Net/Tent	1=Never, 5=Always	4.75	5	.71
Bug Repellent	1=Never, 5=Always	3.81	4	1.36
Sunscreen (twice a day)	1=Never, 5=Always	3.67	4	1.35
Often bitten by mosquitoes	1=Never, 5=Always	3.24	3	1.27
Tobacco in Haiti	0=No, 1=Yes	.30	0	
How often smoked in Haiti	1=Once a month or less, 5=Everyday	4.36	5	1.25
Cigarettes per day	1=Don't Know, 1=1 cigarette, 5=More than a pack a day	3.00	3	
Increase in tobacco	1=Much less, 5=Much more	4.36	5	.86
Alcohol in Haiti	0=No, 1=Yes	.87	1	.34
How often drank alcohol in Haiti	1=Once a month or less, 5=Everyday	2.76	2	1.27
Drank moonshine	0=No, 1=Yes	.27	0	
Increase in alcohol	1=Much less, 5=Much more	2.96	3	1.21
Marijuana in Haiti	0=No, 1=Yes	.14	0	
How often smoke marijuana in Haiti	1=Once a month or less, 5=Everyday	2.25	2	1.29
Increase in marijuana	1=Much less, 5=Much more	2.25	1.5	1.48
Had sex	0=No, 1=Yes	.23	0	
No. of partners	1=1 to 2, 2=3 to 5, 3=6 to 8, 4=9 or more	1.11	1	.32
Frequency with each partner	1=1 to 2 times, 2=3 to 5 times, 3= 6 to 8 times, 4=9 or more times	2.05	2	1.13
Vaginal or anal sex without a condom	0=Never, 5=All the time	1.71	1	1.71
Oral sex without protection	0=Never, 5=All the time	2.17	1	2.14
High risk of catching STI within volunteers	1=Strongly Disagree, 5=Strongly Agree	3.56	4	.92
High risk of catching STI with local community	1=Strongly Disagree, 5=Strongly Agree	3.91	4	.82

Risky Behaviors. Also related to RG2, Table 2 shows that 30% of the sample reported using tobacco products and of those, 84% reported an increase in their usage of tobacco products while in Haiti. Among those who reported drinking alcohol in Haiti (87%), 36% reported an increase in alcohol consumption compared to their use at home and 27% admitted to consuming moonshine during their volunteer service. Meanwhile,

Table 3. Intercorrelation Among Variables

		Frequency of usage of bug repellent	Frequency of usage of sunscreen	Usage of anti-malaria pill	Risk Factor (moonshine marijuana)	Had sex in Haiti	Interaction frequency factor	Rating of quality of relationships
Male	Pearson r	-.34**	-.27*	.03	-.04	-.11	-.10	-.21
	Sig. (2-tailed)	.01	.01	.79	.72	.32	.36	.06
	N	85	85	85	85	84	85	76
Age	Pearson r	.01	.01	.01	-.34**	-.22*	-.43**	-.27*
	Sig. (2-tailed)	.94	.90	.99	.01	.05	.00	.02
	N	84	84	84	84	83	84	75
Volunteer Income	Pearson r	-.11	.09	.05	-.25*	-.22	-.15	-.30*
	Sig. (2-tailed)	.33	.42	.64	.03	.05	.21	.01
	N	77	77	77	77	77	77	71
Previous disaster experience	Pearson r	.09	-.15	-.27*	-.09	.15	.11	-.08
	Sig. (2-tailed)	.44	.18	.01	.41	.19	.31	.50
	N	85	85	85	85	84	85	76
Length of time spent in Haiti	Pearson r	-.08	-.34**	-.15	.38**	.32**	.07	.20
	Sig. (2-tailed)	.50	.01	.18	.00	.01	.51	.09
	N	81	81	82	83	80	83	72

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

the smallest increase in use was for marijuana consumption: only 14% of the sample admitted to using marijuana while in Haiti, and only 25% of those reported an increase in usage.

Having unprotected sex was another risky behavior undertaken by volunteers in Haiti. Nearly one-quarter of the sample had sexual intercourse (anal, vaginal or oral) while in Haiti. Of those, 90% had 1-2 partners. The majority (42%) had on average 1-2 sexual encounters with each partner, 26% reported 3-5 encounters, 16% reported 6-8 encounters, and 16% had over 9 encounters with each partner. Within the 23% who had sex, 29% of those had anal or vaginal sex without using a condom. Similarly, of those having sex, 37% reported having oral sex without the use of protection such as condoms or dental dams.

When asked about their perceptions of risk, 51% of all those surveyed agreed that there was a high risk of catching sexually transmitted infections (STIs) if one engaged in sexual activity within another international volunteer. No respondents reported having a sexual relationship with someone from Leogane and 67% agreed that there was a high risk of contracting an STI if one did so. Based on correlation results (RG3), younger volunteers (r = -.34), volunteers with lower incomes (r = -.25) and volunteers that spent more time in Haiti (r = -.38) were more likely to consume moonshine and marijuana. Younger volunteers (r = -.22), volunteers that spent more time in Haiti (r = .32) and those with lower incomes (r = -.22) were more likely to have had sex in Haiti.

Community Interactions. Related to RG4, Table 4 shows that 66% of respondents believed that there were obstacles in place that kept them from creating a strong relationship with the host community while they were in Haiti. These included language barriers (75%) and cultural barriers (21%). Other barriers related more closely the organization's policies—segregation between international volunteers and host community (19%) and rules and restrictions for the volunteers (15%). It seemed as if volunteers worked to address the language barrier by gaining language skills while in Haiti; results of a paired sample t-test (table not shown) comparing Creole and French skills prior to arriving and after leaving found a significant increase between the two time periods (both p = .000). The biggest increase was found for Creole skills: although 81% spoke no Creole upon arrival, only 7% still spoke no Creole when they left.

When asked to rate their relationship with the Haitian staff and volunteers within the organization, 84% rated their relationships "good" to "very good." However, when rating their relationships with members of the host community, 57% answered "good," and no one characterized their relationships as "very good." Fifty one percent of the respondents reported spending less time with the local volunteers than other international volunteers. And, further highlighting the disconnection between international volunteers and local volunteers, only one person said s/he relied on the local volunteers to help him/her deal with stress; the highest percentage (78%) reported leaning on their fellow international volunteers.

In general, volunteers believed positive interactions with the host community were important for their mission. But, when asked if interaction between themselves and the host community was significant to their work as a volunteer, 37% said no. However, when asked if a strong relationship is between the volunteers and the host community in important to the success of the mission, 97% of the respondent agreed that it was important. In addressing RG 5, Table 4 shows that younger volunteers were more likely to frequently interact with the host community than older volunteers (r = -.43) and to evaluate their relationships with that community as of higher quality (r = -.27). Lower incomes were associated with evaluations of better quality relationships with the Haitian community (r = -.30).

Table 4. Community Interactions.

Variable	Metric	Mean	Median	SD
Creole skills before	1=Not at all, 2=Know some words, 3=Hold basic conversation, 4=Fluent	1.23	1	.55
Creole skills after	1=Not at all, 2=Know some words, 3=Hold basic conversation, 4=Fluent	2.19	2	.61
French skills before	1=Not at all, 2=Know some words, 3=Hold basic conversation, 4=Fluent	1.91	2	1.02
French skills after	1=Not at all, 2=Know some words, 3=Hold basic conversation, 4=Fluent	2.13	2	.95
Relationship with Haitian volunteers and staff	1=Very poor, 5=Very good	4.24	4	.76
Relationship with Haitian community members	1=Very poor, 5=Very good	3.45	4	.74
Time spent with local volunteers compared to other international	1=Much less time, 5=Much more time	2.49	2	.98
Conversed with Haitians	1=Never, 5=Multiple times a day	4.56	5	.85
Played with Haitian children	1=Never, 5=Multiple times a day	3.63	4	1.26
Worked with Haitians	1=Never, 5=Multiple times a day	4.63	5	.84
Shared meal with Haitians	1=Never, 5=Multiple times a day	3.49	4	1.34
Purchased food from Haitians	1=Never, 5=Multiple times a day	3.38	3	1.13
Bought souvenirs	1=Never, 5=Multiple times a day	1.69	1	.94
Drank alcohol with Haitians	1=Never, 5=Multiple times a day	2.70	3	1.11
Interaction with locals not significant to volunteer work	1=Strongly Agree, 5=Strongly Disagree	3.55	4	1.34
How often Haitians involved in work	1=Never, 5=Always	3.62	4	.95

Discussion

Although few studies have examined international disaster volunteers, the discussion will compare findings from this study to the literature as relevant, and draw out their significance. We will also utilize responses from several open-ended questions asked in the survey and the first author's experiences as a volunteer to help us explain the findings.

Volunteer Characteristics

The volunteers were primarily young, unattached, female, highly educated, and from the US. They had volunteered before, be it in their home neighborhoods or previous disaster areas. The relatively young age of the Haiti disaster volunteers matched Wenger and James' (1994) study of relief workers following the Mexico City earthquake in 1985. The physical nature of the work was likely associated with attracting this demographic. Removing rubble from collapsed buildings, demolition, and construction (i.e. schools, composting toilets) were listed as the top three activities by respondents. Like other volunteers (Plummer, et al. 2008; USDL 2010), these volunteers had high levels of education. Although one may have thought that volunteers would be affluent, given the cost of the trip to Haiti, the majority reported household incomes below $30,000 a year. Due to lower incomes, financial assistance was important.

Volunteer Health Behaviors

Protective Measures. The volunteers were well prepared in some areas but poorly prepared in others. Perhaps the most dangerous health risk that the volunteers faced was mosquito-borne illness. The majority of volunteers reported taking anti-malaria pills (61%), which was much higher than the percentage reported by Bhatta et al. (2009) among the volunteers of the VSO (18%). Side effects were a concern for the volunteers in Haiti, especially among the longer-term volunteers. We found that individuals who had been to previous disaster areas (and who were presumably well-traveled) were less likely to use anti-malaria pills. This is illustrated by a 19-year-old respondent, who was not on anti-malarial pills. She also slept without a mosquito net, believing that there was no point in taking anti-malaria pills based on her experiences living in Africa.

In general though, women volunteers were more likely to engage in protective behaviors such as sunscreen and bug repellent. More frequent sunscreen usage among women could be explained by the higher societal expectation of women retaining their beauty, including skin health. Women, on a whole, are more likely to engage in protective behaviors for their health (Lonnquist, Weiss, and Larsen 1992). The volunteers in Haiti used bug repellent and sunscreen at lower levels than the health professional volunteers after Katrina (Swygard and Stafford 2009). Given the higher risk of mosquito-

borne illnesses, the use of bug repellent should have been higher in Haiti than in New Orleans. However, those surveyed by Swygard and Stafford (2008) were health-care professionals, so it is not unexpected that the disaster volunteers in Haiti took fewer protective health behaviors.

Based on the first author's experiences, the NGO left the decision to engage in these protective behaviors up to the volunteers. During and prior to her time in Haiti, the NGO took no direct measures to educate the volunteer population about the importance of using bug repellent, sunscreen, masks for removing rubble or mosquito nets. Generally, any information about the importance of these items was disseminated between the volunteers themselves.

Risky Behaviors. We found some evidence of volunteers engaging in risky behaviors (e.g., having unprotected sex, using drugs, increasing their use of tobacco and alcohol, and consuming moonshine) while volunteering in Haiti. Like Dahlgren et al. (2009), we found that longer duration of residence in Haiti correlated with having sex (as well as higher Risk Factor scores). Dahlgren et al. (2009) also found that the international aid workers justified their risky activities by citing the freedom associated with volunteer work and the difficulty of the environment around them. Survey respondents listed boredom and peer pressure as their reasons for an increase in their sexual activity, alcohol consumption, and drug use. Their listing of boredom helps to illustrate the social confinement of the volunteers on base and lack of engagement with the host community. It is therefore possible that more frequent, high quality interactions with the host community outside of a bar setting could reduce the volunteers' risky behaviors.

Our percentages for the volunteers having sex were similar to those reported for the aid workers from the ICRC (Dahlgren et al. 2009). To avoid assuming heterosexuality among the volunteers, we included a question about oral sex without protection (i.e. condoms and dental dams). The literature addressing the sexual behaviors of aid workers and volunteers had not yet addressed protective behaviors in relation to oral sex. Nearly 40% of those having sex were doing so orally without protection, so inclusion of this behavior is essential for future work.

Volunteers reported substantial alcohol consumption while in Haiti. The percentage reporting an increase in usage while volunteering was 2.6 times the increase in percentage that was reported by ICRC expatriates (Dahlgren et al 2009), but our study population was younger. Perhaps the most telling part of the volunteer drinking culture, which one respondent deemed a "disaster junkie culture" within the organization, was the proximity to a bar less than 100 feet from the base. There were nightly parties in the bar, dance-offs and an ample supply of beer and rum, and at times, moonshine. It was part of the volunteers' routine—finish work and have a beer, then have dinner, go to the nightly meeting, take a bucket shower and head to the bar next door until the 10:00 pm curfew. although not everyone engaged in the alcohol consumption regularly, 87% drank in Haiti and it was embedded in the volunteer culture for this organization. Smoking more heavily

than at home was also common, and the percentage reporting this was 1.9 times greater than the percentage reporting it in Dahgren et al.'s (2009) study. Like drinking, smoking was part of the culture for the volunteers. Cigarettes were cheap, and the popular hangout area in the base was also the "smoking area."

Community Interactions. In general, volunteers did not report extensive interactions with the host community, nor did they report high quality relationships with the Haitians. Younger volunteers did report more frequent interactions with the host community. Many of these interactions occurred at the local bar, which was also frequented by young Haitians. Given the dramatic increase in alcohol consumption by volunteers already discussed, these findings suggest that the international volunteers and members of the host community need venues for interaction and stress release that are not limited to drinking alcohol together.

While nearly every respondent believed that a strong relationship between members of the host community and international volunteers was important to the success of the relief effort, approximately one-third said that interactions with the host community were not significant to their work. Their inability to see a connection between their work and building relationships with the host community could be attributed to shyness, the language barriers, or the belief that they were not there long enough to make a lasting connection. It may also suggest that they believe that the organization should be responsible for helping them make a connection. This is supported by the results, as many volunteers felt that the organization's policies created obstacles to their connecting with the host community.

This disconnect may exist, in part because, as the first author observed during her service, the local volunteers were not given supervisory positions, or allowed to take the lead in work situations. This created a situation in which, whether purposefully or without intent, an elitist position was reinforced, as was highlighted by McBride et. al (2006). Although international volunteers were generally unskilled until they were taught a job in Haiti, they were given the role of teachers and supervisors for the unpaid Haitian volunteers (and other international volunteers). This exemplifies the 'us and them' dichotomy that was mentioned in previous literature (Raymond and Hall 2008, Simpson 2004). Based on the first-author's observations, there were many times that members of the host community had more work experience in areas where international volunteers struggled, such as with masonry. However, the international volunteers still held the leadship positions, which negatively impacted personal relationships between international and local volunteers.

Language barriers were the most commonly reported obstacle for the international volunteers to forming relationships with the host community. Although there was a significant improvement in both Creole and French skills among the volunteers, they did not become fluent. Language barriers inhibit volunteers from truly being able to meet the needs of the host community (Cohn and Wood 1985). International volunteers in Haiti

were only able to interact with what Cohn and Wood (1985) called the "westernized elite population", as they were limited in their ability to communicate with the average Haitian because of their limited Creole and French language skills.

Conclusion

In sum, we found that the majority of the volunteers engaged in protective behaviors with regards to their health. We also found that longer residence is Haiti was associated with risky behavior. Unfortunately, the volunteers reported barriers to creating quality relationships with the host community, some of which related to the organization's policies. They also recognized a disconnect between themselves and members of the host community, despite believing that strong relationships were important to the success of the relief effort.

There were several limitations to this study, the first of which was the time gap between the disaster and the data collection. Future research may benefit from collecting data from volunteers closer to the disaster. Second, the incidence of risky behavior may have been underestimated in this study. Volunteers that engaged in risky behaviors while in Haiti may have been less likely to participate in a 20 to 40 minute online survey and be less likely to discover the survey link, which was located in an e-newsletter they may have been less likely to open and read. Therefore, there may have been a higher incidence of risky behaviors than reported here, especially when referencing the first author's own experiences as a volunteer. During the time when the first author was deployed as a volunteer in Haiti, she observed daily cases of drinking and sexual behavior within the volunteer living space. Third, the data collection approach was not ideal in terms of survey research protocol (e.g., Dillman 2008), but was all the organization would permit. To review, the survey was emailed to former volunteers of an US-based NGO through their volunteer newsletter. Due to spam filters and individuals not opening the newsletter, volunteers may not have received the link, and therefore did not have the opportunity to participate in the survey. This is a limitation of emailing an online survey through a newsletter but the NGO would not permit us to send the survey link in a separate email. This also means we cannot calculate an exact response rate for the survey.

Fourth, we cannot determine if the sample is biased, as the NGO did not respond to multiple requests for demographic information on their volunteers. Given this, we cannot determine if our sample over- or under-represents certain segments of the volunteer population with this NGO and if there is sampling bias due to the low estimated response rate. This makes it difficult to ascertain the validity of the study. However, given the dearth of information on international disaster volunteers, we feel the information presented in this paper is still valuable, in spite of these data collection limitations.

This study was not representative of the entire international disaster volunteer community in Haiti and did not include the point of view of the Haitian volunteers, as it

only was emailed out to the former international volunteers of one NGO. We do not know how representative this NGO is of others responding to the earthquake. Additional organizations based in Haiti may not have engaged in the same behaviors as the volunteers for this organization. The NGO in this study was a secular organization, as opposed to a faith-based organization. Given this, there were few policies in place for the volunteers addressing the moral behaviors and actions that we focus on in this study (e.g., sex and drinking). We believe that the findings might be different among volunteers with the many faith-based organizations operating in Haiti following the 2010 earthquake.

Future research could be comparative, done both through multiple organizations responding to the same disaster (e.g., secular and faith-based), or through this organization in other disaster areas. The number of volunteers responding to the survey was low, which limited our ability to conduct multivariate statistical analyses. Future researchers should strive to collaborate with organizations that will permit them to contact possible participants directly.

The practical implications of this study include the importance of NGOs focusing on policies that promote the well-being of their volunteers. For example, given that volunteers engage in sexual behaviors while abroad, the organizations hosting them must recognize this and deal with it openly. The organization under study provided condoms, but they refrained from discussing sexual health. During the first-author's month in Haiti, the only time this was addressed by the staff was during a meeting, because the hospital was being "overrun" with volunteers complaining of urinary tract infections and requesting emergency contraception.

Disaster relief efforts overall will benefit if NGOs focus on creating tighter bonds between the affected population and international volunteers, as this will help to reduce power differentials and improve the quality of their working relationship. In more recent months, the NGO under study led a push to empower the host community by integrating some residents into supervisory positions. As Raymond and Hall (2008) pointed out, it is important to integrate local staff and community members with the international volunteers. Due to concerns for health and safety, the emphasis on drinking as the main way to bring together the affected community and the international volunteers should be reduced. This NGO recently began a project to build a soccer field in Leogane and participate in a game with residents. Continuing games among the volunteer population and the host community, not necessarily playing against each other, but with each other, would likely assist in building stronger relationships. More projects like this will likely create a stronger connection between international volunteers and the host community. It may be that stronger relationships will be linked to better volunteer health and fewer risky behaviors.

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Emergency Planning and Disabled Populations: Assessing the FNSS Approach

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Emergency managers face a variety of planning challenges, especially because the needs of any community are heterogeneous. One illustration of these planning challenges is the historical neglect of community members with disabilities or other functional needs. The salience of including residents with disabilities and other functional needs gained momentum in the Post-Katrina environment. Within this context, the Federal Emergency Management Agency developed the Functional Need Support Services (FNSS) approach to disaster evacuation shelter management. In this paper, we assess the FNSS model and identify several key challenges that can be expected in the development and implementation of this approach based on a social construction approach to understanding policy making. These challenges can be thought to be generally relevant to most new programmatic initiatives, but as we show in this case, are particularly applicable to community-wide hosting of evacuees. Interviews with key stakeholders with experience in evacuation hosting reveal deep seated social constructions of residents with functional needs that may constrain the possible impact of the FNSS guidance.

Keywords: Functional needs, emergency planning, social construction, disability, disaster, evacuation.

Introduction

In February 2011, a federal judge found that the City and County of Los Angeles had made insufficient efforts in accommodating people with functional needs in its emergency management planning processes.[1] The class action law suit targeted the city's emergency plan and its limited attention to issues of accommodation in transportation, sheltering, and other relevant services. Judge Consuelo Marshall offered a summary judgment that the existing plans' neglect of residents with functional needs represented a violation of the Americans with Disabilities Act of 1990 (ADA). The plaintiffs in the case argued that such neglect placed residents with functional needs at greater risk as well as a state of "fear, apprehension, and unease because they believe they have a right to be, but are not, included in the City's emergency preparedness program" (Communities Actively Living Independent and Free, et al. v. City of Los Angeles, et al. 2011). This neglect, the plaintiffs argued, constituted discrimination on the basis of disability.

This judgment was not a surprise. The City's Department of Disability (LA-DoD) had previously reported that the emergency plan was "seriously out of compliance" (Communities Actively Living Independent and Free, et al. v. City of Los Angeles, et al. 2011) with the ADA and local ordinances requiring accommodation of residents with disabilities. The LA-DoD recommended that the City immediately conduct a sweeping assessment of its emergency plan in relation to residents with functional needs including: (a) an assessment of all facilities used in the plan including shelters, warming centers, etc.; (b) increase coordination with the American Red Cross (ARC) on issues related to disability; and (c) an assessment of warning and notification systems.

Although the City of Los Angeles conducted an assessment of shelter sites, it failed to address the LA-DOD's other recommendations. The City' response was that the record did not indicate a policy of active discrimination. The defendant city said that it "has not taken any action which disproportionately burdens people with disabilities" (Communities Actively Living Independent and Free, et al. v. City of Los Angeles, et al. 2011, 19). This, the City had concluded, proved that it has not excluded people with functional needs by reason of those very needs from the emergency plans. But the judge in the case accepted the plaintiff's claims of neglect and found in their favor. Moreover, the judge found the evidence sufficiently convincing to offer summary judgment on the matter.

The significance of the case lies in a reality that the City of Los Angeles was not unique in being deficient in accommodating residents with functional needs. In fact, it is not unfair to consider Los Angeles as operating within the bounds of common practice. Thus, the case underscores that such common practices are insufficient.

At the same time, it is also important to recognize that with this recent legal decision, many other cities, counties, and states are currently developing plans to better protect the residents with functional needs and watching what legal standards emerge to define

reasonable accommodation. Given the challenges of accommodating residents with functional needs in emergency management, the Federal Emergency Management Agency (FEMA) has sought to provide guidance and direction to state and local government and other key actors involved in disaster response, recovery, and general relief services. An example is FEMA's Functional Needs Services System (FNSS) for evacuation hosting.

Because of the significance of this federal effort we consider three key questions. First, how is the FNSS approach designed and how will it affect emergency management practice? Second, how can we understand the social construction of the concept of "functional needs" and how is it relevant to policy and practice of emergency management? Third, what do the attitudinal dispositions of emergency management professional suggest as to the relative ease or difficulty of implementing the core principles of the FNSS approach?

To answer these questions, we (a) review the major, recent developments in the accommodation of residents with functional needs in general population shelters, and (b) examine specific challenges to the approach related to evacuation hosting. Following this review, we discuss the social construction of disability and the forces contributing to the historical exclusion of people with disabilities.

Although most research has focused on the preparedness and disaster recovery for and of individuals with disabilities (e.g., Bricout and Baker 2010a; Bricout and Baker 2010b; Peek and Stough 2010; Spence, Lachlan, Burke, and Seeger 2007), this study examines the attitudes of emergency managers towards populations with functional needs and the implications of these attitudes for the FNSS approach. In doing so, we focus on the incorporation of non-traditional participants in emergency planning (Robinson and Gerber 2007). We draw upon original interviews with shelter managers from multiple communities across the country to support the applicability of the social construction of disability to emergency management. The article concludes with a discussion of the likely impact of the FEMA guidance in the presence of the exclusionary social forces identified earlier.

The Functional Needs Approach and Disaster Management

Responding to calls to increase attention to persons with disabilities, FEMA recently clarified and improved its guidance to emergency managers through the adoption of a new model: Functional Need Support Service (FEMA 2010). This approach seems specific to the management of shelters; but the basic model provides a view of what integration practices can and should look like more generally. For example, the guidance documents include specific guidelines for the design of accessible restrooms along with general information on consulting organizations that specialize in advocacy for residents with functional needs. Further, the approach is also a bellwether of inclusion strategies

for a variety of other social service areas. That is, there is nothing inherent to a "functional needs" approach to shelter management that limits its application to matters of to shelter management or, even, emergency management as a whole. Rather, social service administration from a variety of domains may see in the FNSS an example of what an inclusiveness strategy may look like.

In this section, we describe the FNSS approach and the guidance it directs to shelter managers. We start by laying out the guiding principles of the FNSS approach to provide context and then elucidate values that motivate the strategy. We follow this with deeper investigation of two components of the FNSS guidance document—stakeholder consultation and special services.

Guiding Legal and Operational Principles

The FNSS guidance starts with a strong legal disclaimer. After a brief introduction, FEMA devotes the second paragraph to all of the functions the document does not serve. The document is not intended to stake a new claim to authority over shelter management (a task generally delegated to state and local levels of government) or to create new legal obligations. The FNSS approach is intended to provide support for existing obligations rather than imply new ones. In light of the recent court decision discussed above, this is an important qualifier. However, announcing a set of practices—even if said to be consistent with existing legal obligations—creates an *implicit* standard for accommodating residents with functional needs. This nuance makes the document extremely important for any emergency management official with responsibilities related to sheltering; ignoring the guidance may place one's preparedness below an appropriate performance level. To the extent that such common management practices could shape legal definitions of reasonable expectations for the accommodation of functional needs, emergency management officials must pay close attention to such formal guidance. Furthermore, these common expectations reflect closely on FEMA's general policy and the accommodation of residents with functional needs.

The legal environment for emergency management is complicated, particularly as related to the accommodation of residents with functional needs. The Stafford Act and the more recent Post-Katrina Emergency Management Reform Act provide a set of legal principles that guide emergency management—including shelter management. The general principle is one of non-discrimination—but there is a tremendous amount of ambiguity. To clarify this general principle, the FEMA guidance document provides more specific operative principles (FEMA 2010, 10-11). These are self-determination; no "one-size-fits-all" approach; equal opportunity; inclusion; integration; physical access; equal access; effective communication; program modification; and no charge.

Based on the belief that the each person with a disability is most capable of defining his or her own needs, the approach calls for active, specific accommodation. Shelters are

required to make themselves accommodating places for people with disabilities rather than segregating these people into separate locations. Shelter planners are required to take all reasonable steps to ensure this accessibility. In practice, the process of mainstreaming people with disabilities is blurry—as our review of reports from the field will illustrate in a later section.

The series of operational principles listed above enunciates some of the dimensions of accommodation. Most obviously, shelters must allow access to the physical location. However, access to the physical location is not enough. The guidance emphasizes the need for accommodation of functional needs within the shelter including communication and all of the diverse services that the shelter provides. It is in this diversity that the FNSS approach stands out compared to previous approaches.

Following vague or general pronouncements of inclusiveness and accommodation, the FNSS approach provides a strategy for emergency managers to better understand the overall diversity of functional needs present in their populations. The focus on the functional needs associated with disabilities directs attention to the specific action and accommodations required to achieve inclusion. This also provides a heuristic device to categorize needs to simplify their diversity. Focusing on functional needs transforms characterizations of disabilities into actionable descriptions. Within the FNSS approach, one may focus on how sensory limitations affect a broad range of emergency management issues. For instance, how will alert systems notify people with various sensory limitations? How will people with cognitive limitations interpret the notifications? Rather than asking emergency managers to understand the wide variety of conditions related to a variety of impairments, the FNSS focuses attention on meeting classes of functional needs, each of which results from a variety of specific conditions.

In the next sections, we will discuss two specific elements of the FNSS to illustrate the guidance offered within the document. These examples are taken as illustrations and do not represent the entirety of the FNSS guidance document. These examples, though, are each inherently important while also providing a sense of what the FNSS calls upon emergency managers to do.

Stakeholder Consultation

The FNSS guidance notes that the expertise required to prepare properly for the integration of residents with functional needs seldom resides within offices of emergency management. Generally speaking, prior inattention to issues related to residents with functional needs has left emergency management offices without a long-standing history of comprehensive planning. As a result, a major resource, or perhaps the best information likely available in many communities, lies within the community itself—advocacy groups, service providers, and those other community government units serving residents with functional needs represent an effective starting point for informing planning efforts.

Tapping into this expertise requires a broad view of potential partners. For instance, government agencies primarily responsible for clients with functional needs are an important partner in the process of writing inclusive emergency plans. However, stakeholder partnerships go beyond peer governmental agencies. Key partners within any community include specific service provider organizations from the nonprofit sector (e.g., Centers for Independent Living), as well as service provider organizations from the for-profit sector (e.g. various health and congregate care facilities).

A single organization rarely possesses the expertise to include residents with needs as diverse as sensory differences and residents with mobility differences. For example, organizations serving residents with mental health functional needs have frequently little interaction with organizations serving residents with mobility differences. Emergency managers on the other hand need to seek out all relevant organizations and bring them into the planning process. The guidance document provides some examples and resources for identifying and integrating these organizations within one's community. Although vague, FEMA (2010, p. 16) provides general recommendations to coordinate with individuals requiring support services, agencies and organizations that provide those services and organizations that advocate for the rights of individuals requiring FNSS. Further, the recommendations also suggest specific attention to, and indicate practices for, managing issues related to durable medical equipment, consumable medical supplies, and communication providers. The recommendation also includes a specific example of well-developed functional need guidance (from New Hampshire) to illustrate the diversity of partners with whom one must coordinate.

Functional Services

Possibly the greatest assistance the FNSS provides is its application to the specific domain of shelter management. Although some communities across the U.S. have made a transition to greater inclusiveness in planning efforts related to emergencies and hazard mitigation—a process the FNSS intends to accelerate—shelter management remains a complex undertaking and thus a challenge for effective performance. Indeed, the list of tasks associated with transitioning to a fully accessible shelter is extensive. The FNSS approach helps to simplify the complex task of including shelter residents by focusing attention on specific functional needs. This division of the complex environment of conditions into clusters of functional needs helps systematize efforts.

Consider the example of mobility-related disabilities. Mobility disabilities can take a variety of forms. One must consider access and mobility issues within a shelter for those in wheelchairs, those with walkers, or those requiring only the assistance of a cane. Each of these disabilities presents specific challenges, but grouping them together as mobility limitations aids in planning and the process of inclusion.

The boundaries between these functional categories are blurry. A person with sensory differences (e.g., blindness) might also have mobility differences or their blindness may limit their ability to navigate the shelter. In fact, specific conditions may lead to a variety of considerations in accommodating an individual's needs in a shelter setting. Thus, blindness has implications for mobility considerations within a mass shelter environment, to mention just one example.

Within the context of shelter management, the guidance brings attention to issues that are easy to neglect when focused exclusively on abled populations within general population shelters. Although mobility and sensory differences might be generally familiar issues, a broader range of specific challenges to shelter design and management speak to the complexity of effective performance in sheltering all members of a community. The not-so-obvious list of these considerations includes dietary needs, service animals, communication, bathing and toileting needs, quiet areas, mental health services, medical and dental services, medication, and transportation services.

Within each of these areas of functional support, the guidance provides information on standards and resources available. Consider the example of bathing and toileting needs. In this section, the focus is on creating accessible bathing and toileting facilities for people with functional needs. Specific information is offered on issues ranging from where to find Red Cross requirements on accessible and compliant toilet rooms to specific logistics related to bathroom stalls. Although the guidance document does not itself provide detailed recommendation such as full compliance requirements for bathing facilities, it provides extensive references to direct shelter managers towards available supporting information. The guidance is designed to assist shelter and emergency managers to understand the nature of a FNSS system and spotlight relevant available information.

Social Construction and Policy Decision Making

The changes in policy guidance for addressing the interests of shelter residents with functional needs represent a serious and substantive policy effort. But as was stated in the introduction, a critical question to ask is: how can we understand the potential impact of the FNSS approach? One means of addressing this question is to recognize the underlying causes of historic marginalization. Indeed, the social construction theory of public policy-making provides some reason to believe that changes in policy guidance are unlikely to penetrate deep enough into administrative processes that have created and supported the historical neglect of persons with functional needs.

Social construction theories emphasize how specific policies, from both legislation and the choice of policy tools to the implementation process, are the product of the characteristics attributed to the target populations (Schneider and Ingram 1993, 1997). Schneider and Ingram focused on two dimensions distinguishing different target

population characterizations: First, target populations vary in terms of their perceived political power. For example: owners and executives of large finance firms, as affluent actors with access to political officials, are politically powerful. In contrast, homeless people have little (or more likely) no meaningful access to political power. Second, target populations vary in their perceived level of deservingness of public support. The public (and policy makers) consider military veterans to be deserving of public support. Drug addicts, on the contrary, are frequently considered to be undeserving of public support.

The conjunction of these two dimensions creates four categories of target populations: (1) Strong and deserving target populations are considered advantaged; (2) Strong but undeserving target populations are contenders; (3) Weak but undeserving target populations are deviants and (4) Weak but deserving target populations are dependents (Schneider and Ingram 1993, 1997).

Each different type of target population creates a different environment for policy formulation and implementation. The case of deviant target populations is easy to consider. Imposing costs or using punitive policy tools on members of this population is likely to be popular with most of the public. Proposing a crackdown on drug abusers or sex offenders, for example, is likely to be popular with the public because these groups are unlikely to mobilize political influence. Such a target population is a "political opportunity" for policymakers (Schneider and Ingram 1997, 114). Using similar policy tools or implementation strategies to regulate the behavior of advantaged target populations, such as financial managers, is politically "risky".

The political incentives evoked by target population characteristics provide the context for policy development and policy implementation. This fundamental role for the social construction of target population influences the treatment of members of these groups throughout the policy process—including the treatment of residents with functional needs in their implementation of emergency management policies and the inclusion (or exclusion) from emergency planning operations. Anticipating the impact of the FNSS strategy for emergency management requires a clear understanding the social construction of residents with functional needs.

Scholars of disability policy have long considered our dialogue about disability in society to be limited (Oliver 1986). Traditional approaches to discussing functional needs have focused on "personal tragedy" rather than on social context (Oliver 1986: 6)). This approach ignores the extent to which the isolation of people with functional needs from social life is not predetermined by biology. Instead, this isolation is also a product of social institutions. This critical understanding of functional needs requires a shift from an exclusively medical understanding of functional needs to one that embraces their social nature.

The medical view that social restrictions of disabled people are a consequence of physical dysfunctions was overturned by a radical move that argued people with impairments were disabled by a social system which erected barriers to their

participation. Disability was not an outcome of bodily pathology, but of social organization: it was socially produced by systematic patterns of exclusion that were—quite literally—built into the social fabric. The built environment, for example, was built for non-disabled people and the norms of construction are such that those with impairments may, and often do, find themselves excluded from a whole range of social spaces that non-disabled people that for granted (Hughes and Paterson 1997).

Research into the ADA of 1990 has identified the social constructions of disability as a key influence on the reaction to functional needs accommodation in the workplace (Harlan and Robert 1998). The law requires that employers make "reasonable accommodations" to allow people with functional needs to work within their organizations. The reactions of employers to this mandate reveal how our society defines and attributes characteristics to people with functional needs. Most notably, interview research into employer attitudes towards disabled employees documents resistance to ADA's implementation (Harlan and Robert 1998).

This research literature supports the argument that social constructions of people with functional needs as a target population for legislation influences policy making and implementation. In the Schneider and Ingram (1997) framework, people with functional needs most closely fit into the dependent category. However, there are important limitations. Although the research indicates that people with functional needs possess relatively low levels of political power, the issues of deservingness is somewhat complicated. By and large, the population is considered deserving of public assistance but the use of regulatory authority to support integration through the ADA reveals that there are limits to this sense of deservingness. While deserving of some minimum level of support, there is greater resistance to more thorough forms of integration within the "reasonable accommodation" requirement. This resistance takes the form of passivity of implementation and growing resentment toward disabled people for the extra effort required to accommodate them.

Studies of ADA implementation suggest that these deeply held characterizations of disabled people may limit the influence that the FNSS approach to emergency planning will have (e.g. Harlan and Robert 1998). Schneider and Ingram anticipated this neglect and unstable protection from discrimination when they suggest that "dependent" populations are easy to ignore. The issues of dependent populations are likely to remain low on the political and administration agenda. When there is action, it is likely to quite limited, exclusionary (requiring extensive documentation of eligibility), and particularistic. This makes it easy for policymakers, be they legislators or executive officials, to announce grandiose plans to support dependent populations and then ignore or refuse to fund actual service provision.

The influence of these social constructions is likely to be all the more acute in an emergency management context. Emergency management, including emergency planning and emergency response, faces the combination of limited resources and

unlimited demand that Lipsky identifies as defining street-level bureaucracy (Lipsky 1980). These conditions lead to triage and queuing behaviors which suggests the likelihood of continued marginalization of people with functional needs. Emergencies are likely to magnify these processes as decision-makers tend to fall back on their habits and/or long-held perceptions and sense of normality—including what a "normal" resident needs (Weick 1993). When the environment is unreliable, one is likely to fall back on simplifications of one's situation when one has to act—a response that is not unique to emergencies or disasters. This act of making sense of a catastrophic situation reinforces the considerations one thinks of as normal, typical, and habitual. Time pressures are only likely to reinforce the process of falling back on habit and simplistic constructions of one's normal situation. All of these pressures underscore the real and significant challenges the FNSS approach faces in its goal of improving assistance to community residents with functional needs.

Accounts of Functional Needs Accommodation in Disaster Situations

Social construction processes are relevant to the implementation of a broad range of policies related to functional needs and underpin an examination of whether perceptions and attitudes of public personnel reinforce the basic claims of social construction process—either in positive or negative directions. FEMA's FNSS guidance serves as a case study of an agency whose primary responsibility is not limited to those with functional needs—even though its function involves serving these residents. Shelter management has become a particular test case for how FEMA will integrate concerns related to functional needs into emergency planning. In this regard, the FNSS guidance for shelter management provides a view into the potential trajectory for a broad range of functional needs integration strategies within and beyond FEMA.

Over the past two years, we have completed interviews of 23 emergency management officials in six communities focusing specifically on the subject of evacuation ingress and hosting. The interviews took place in four communities along the Gulf Coast (Lakeland, FL; Shreveport, LA; Birmingham, AL; College Station, TX) as well as Riverside, CA and Tulsa, OK—all of which had recent experience in hosting evacuees. Each site visit included semi-structured interviews (Weiss 1995) of local government officials and nonprofit organizations involved in emergency management and evacuation hosting. Interviews averaged between 45 minutes and 2 hours involving multiple research team members.[2] Interviews were recorded and transcribed to ensure accuracy beyond the research team's interview notes.[3]

As part of these semi-structured interviews, we devoted time to issues related to functional needs ingress and sheltering. These interviews revealed perspectives similar to those expected from the social construction theory of policy development and implementation. Despite careful case selection of interview respondents, the data do not

permit inference to the proportion of emergency management officials in the population with similar views. Instead, these interviews revealed the existence of various opinions consistent with social construction theories of policy implementation. We leave investigation of proportions and frequencies of these views to future research designs better suited for such questions. In matters of the inclusion of disabled people in emergency planning, we find evidence of social construction emerging in two areas: (1) the distinctiveness of disabled populations and (2) the expense and demand for inclusion.

The Distinctiveness of Disabled Populations

The most noticeable pattern among emergency management professionals was the compartmentalization of people with functional needs—especially as defined by presence of a disability. The formal requirements of evacuation sheltering accentuated this compartmentalization by creating special shelters for evacuees with specific medical needs.[4] The justification for such specialized shelters makes sense: evacuees with some medical needs may require access to specific medical technologies or assistance. It would be difficult to accommodate these needs within a general population shelter. Simply put, these evacuees require much more assistance services than is available within general population shelters.

The difficulty in implementing this strategy is presence of a tremendous grey area in distinguishing between medical needs and non-medical disabilities. This ambiguity is particularly the case with chronic illnesses such as diabetes and conditions requiring dialysis. The guiding principles of the FNSS include “equal opportunity,” “equal access,” and “integration.” These principles work at cross-purposes to the strategy of establishing separate medical special needs shelters. The result is a strategy that segregates medical special needs while mainstreaming people with functional needs. In addressing this issues, the FNSS guidance document only says that there is no “one-size-fits all” solution.

Several clear patterns emerged from the interviews. The contradiction between integration of functional needs and differentiation of medical needs frustrates many emergency management professionals as well as advocates (and self-advocates) of disabled people. Shelter managers are asked to integrate people with functional needs to the maximum possible extent while those with specific needs (medical special needs) require direct accommodation in specially managed facilities. These medical special needs shelters involve strict regulation including limitations of who can accompany an evacuee requiring assistance. This policy, which is necessitated by the dramatically limited space available within the medical-special needs shelters, commonly leads to dividing families between separate sheltering facilities.

The dilemmas associated with these sorts of management practices accentuate the distinctiveness of people with functional needs. Shelter managers must screen people to determine whether to send them to medical special-needs shelters. Those who are

included in mainstream shelters must be accommodated (within the mandate of there being no "one-size-fits-all" approach) based on their specific functional needs. As a result, emergency managers and related personnel must know a great deal about the nature of functional needs as well as accommodative technologies and strategies.

Within this environment of contradictions and tensions, emergency management professionals consistently reported being overwhelmed by, and under-informed about, the needs of people with functional needs. Some interview subjects asserted that they cannot keep up with the various functional needs and associated accommodations relevant to their work. What becomes clear in these statements is that the accommodation of people with functional needs is considered an additional responsibility distinguished from accommodating "normal" residents and evacuees. This distinction between the service of the "normal" and the "other" residents and evacuees amplifies existing or prior marginalization of the disabled and other functional needs populations.

The Expense and Demand for Inclusion

An explicitly acknowledged view held by some of the interviewees was that accommodation of people with functional needs is not simply an administrative burden but also represents a significant financial burden. A general theme within the interviews was that increased accommodation of functional needs in general population shelters is associated with an increased cost burden on local communities managing those shelters. This view can be summarized as stating an opportunity cost concern; local authorities report being resource constrained so additional obligations reduce their ability to meet other key functions.

At one level, this reaction to the expense of functional needs accommodation seems to indicate the marginal position of people with functional needs within emergency preparedness processes. Just as many emergency managers distinguished the accommodation of people with functional needs from the accommodation of the needs of "normal" residents, the expense of accommodating the functional needs is seen as an additional burden rather than a part of the core mission of managing community needs during emergencies and disasters. Instead, some emergency management professionals interviewed see accommodating functional needs as an additional (and novel) requirement imposed on them during already lean and demanding times. This adds to the cost generally associated with bringing in new partners to emergency planning processes (cf. Robinson 2011).

It is important to note that only a small number of interview subjects gave a sense that calls for inclusion of disabled people are overly demanding. Those that did, however, gave subtle indication that accommodating functional needs might not be considered a core function. Instead, a fair characterization of the view stated by several interview subjects is that accommodation is seen as an admirable goal and a legitimate use of slack

resources—but that it remains an add-on obligation rather than a routine element of preparedness for the whole community.

Discussion and Conclusion

The social construction theory of policy development (particularly, in this case, as applied to implementation) indicates the challenges associated with anticipating a positive impact for the FNSS strategy. The forces that have historically led to the marginalization of people with functional needs are still present and cannot be altered dramatically simply through the issuance of policy guidance. Longstanding preconceptions of people with functional needs as aberrant (as opposed to "normal") and the perception that these demands on local government for integration and accommodation are excessively costly are fundamental challenges to meaningful integration and accommodation.

This is not to say that the FNSS is not an admirable step forward. Recognizing the presence of a range of functional needs as a core feature of a community—not as a tertiary consideration—is an important part of the process of changing deeply seated social constructions. This process of change will be slow but has to begin somewhere. Raising awareness of functional needs is a vital first step toward initiating positive change.

The second contribution of the FNSS guidance is the strong set of recommendations (and tools) for the more direct involvement in shelter management of service provider and advocacy organizations serving the interests of people with functional needs. One view of any policy guidance document such as the FNSS is that its impact is almost destined to be limited. Guidance documents such as the FNSS tend to be static and limited in scope (in this case, confined to issues of shelter management) and, as such, may easily find its way to a shelf to be neglected. However, integrating organizations that serve residents with functional needs may build a voice for people with functional needs into the process itself. This presents the opportunity to start a long-term process of integration and inclusion. In the end, the pressure must come from within each community and be present within each emergency management network if it is to be effective at inducing inclusion. A guidance document from a federal agency, particularly one that takes great pains to make clear that the document should not be interpreted as creating new responsibilities, will have very little effect in displacing the complex of social forces that have created and perpetuated exclusion. Only by building countervailing forces for inclusion is there likely to be any change. The tools within the FNSS to assist in the integration of disability service organizations may serve to do just this.

Engagement can take on many forms but should be a priority for emergency managers. It will be through the slow process of engagement and mutual education that

attitudes related to residents' functional needs will change. This will involve engaging organization not traditionally associated with emergency management (Robinson and Gerber 2007) but need not be disruptive. Engagement and inclusion can be selective and limited at first. Partners with experience providing services to residents with functional needs do not need to be involved in every meeting at first. Inclusion can emerge slowly, starting with limited (low opportunity cost) communication and meetings before moving to (higher opportunity cost) formalized relationships (cf. Robinson and Gaddis 2012). However, FEMA directives such as the FNSS guidance document cannot replace these engagement and inclusion activities.

It is important to note that the development of a strategy for including people with functional needs is not unique to emergency management and FEMA. Although medical and health care organizations have long faced difficulties related to providing access to persons with functional needs, many social service organizations are only recently starting to come to grips with this demand. The FNSS guidance provides a view into one policy domain's attempt to grapple with these issues, but may provide a preview of what similar approaches can or should look like in domains as diverse as education, transportation, housing, or nutritional support. In the end, all service areas will have to face this issue. Only time will tell the extent to which other areas adopt an approach similar to the FNSS.

Notes

1. The Federal Emergency Management Agency no longer uses the term "special needs" in part because it was too broad and lacked descriptive utility. As a result, the term "functional needs" is used as a means of greater descriptive precision; accordingly we use that term throughout this paper.
2. The interviews were on the subject of evacuation hosting generally. Within the semi- structured protocol there were specific questions related to the organization of and experience with sheltering of people with functional needs.
3. We read the interview transcripts and reviewed interview notes to collect references to functional needs and related terms/concepts. The comments came disproportionately from the questions directed at issues related to functional needs – but not exclusively so. It is important to note that a majority of the interviews took place before the FNSS report was released and responses were not unduly influenced by the existence of a FEMA guidance document on the issue.
4. There are, in fact, a variety of specially designated shelters but we will use the simple distinction between medical special needs and general population shelters to motivate this discussion.

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BOOK REVIEWS

Building Resilience: Social Capital in Post-Disaster Recovery, by Daniel P. Aldrich, 2012 University of Chicago Press.

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Only the most politically naïve would assume that capital, whether financial or social, is always a force for good. Be that as it may, Aldrich's solid case for taking a second look at the role of social capital in disaster recovery is a useful contribution to the still-sparse recovery literature.

The book opens with a couple of introductory chapters laying out the thesis that social capital can both help and hinder recovery, depending on who controls it, thus social capital is "Janus-faced". As is the case with financial capital, the haves benefit while the have-nots are potentially harmed by its absence. This harm is especially evident in cases of marginalized segments of the population, such as lower-ranking castes in India or less-organized neighborhoods in the US.

Aldrich divides social capital into "bonding", "bridging" and "linking" types, which are analogous to the earlier distinction between horizontal (peer-to-peer) and vertical (rank-to-rank) linkages, although most of the book focuses on bonding and linking versions of social capital. It should be noted that the phrases "social capital" and "social networks" are used nearly interchangeably in this book, a usage some readers may not approve.

The heart of the book is the four analytic chapters, comprising four mixed method recovery case studies—Tokyo's 1923 earthquake, Kobe's 1995 earthquake, the 2004 Indian Ocean tsunami (focusing on Tamil Nadu, India), and Hurricane Katrina in 2005. In the Tokyo case, the indicators of social capital are voter turnout and number of political gatherings per year, and the dependent variable is population growth rate. Aldrich shows that the neighborhoods with the highest values for the social capital variables had higher population growth rates after the disaster. The well-known attacks on ethnic Koreans are described as an illustration of the dangers to "out-groups" of high levels of bonding social capital, especially when bonding capital is high among the majority and bridging (group-to-group) capital is low or absent.

The Kobe case also uses population growth as the dependent variable, whereas social capital is measured by the number of new non-profit organizations formed per capita in each ward. Again the importance of social capital is confirmed, as this independent variable outperformed all the others (percentage of the population affected, welfare-dependent households per capita, population density, and socioeconomic inequality) in the analysis.

The Indian Ocean chapter is the longest and most involved, using several data sets gathered from various districts in Tamil Nadu state. The dependent variable is the amount of relief per family in rupees. A wide range of demographic control variables and indicators of socioeconomic status are used. Linking social capital is indicated by source of family relief aid (government, NGOs, or both) and family contact with government agencies. Bonding capital is indicated by the number of funerals attended in the three months before the disaster and the amount of money given at weddings in the same period. Both bonding and linking social capital had significant effects on the amount of relief families received. However, other variables such as caste and marital status also had strong effects, which Aldrich views as underlining the potential social capital has for making traditional out-groups suffer disproportionate levels of exclusion from recovery assistance—an illustration of social capital's Janus-face.

The final case is New Orleans after Katrina. The indicator of recovery here is the number of trailer sites and number of trailers per neighborhood, with trailers and trailer parks defined as "public bads" that "impose focused costs on local communities but provide diffuse benefits to cities and regions as a whole" (p. 136). Social capital in this case has a single indicator, voter turnout. Voter turnout had a strong negative effect on the siting of both trailer parks and individual trailers in neighborhoods.

Problems with the book include the minor (incorrect citation of the Indian scholar Swaroop Reddy as Reddy Swaroop on page ix) to the more important ones such as the use of a single indicator for a complex concept (social capital) in a case where other indicators, some of them used in other chapters of the book, are available (Chapter 6). It was also bothersome to have to look up the statistical tables in the back of the book, because the author thought that it is easier for readers to understand graphs of simulations involving two variables. This may be useful for some readers, but I found it annoying.

There are other, perhaps more serious objections (does the use of cases from three nations really allow cultural explanations to be altogether dismissed?) but in the main the book is a valuable contribution to the literature, and useful for classes, especially at the graduate level. The case studies are more involved than the short descriptions given here indicate, and scholars of disaster will find a great deal of material for debate and discussion in this book.

Disaster Diplomacy: How Disasters Affect Peace and Conflict by Ilan Kelman, 2013 Routledge

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This book focuses on how and why disaster-related activities do and do not yield diplomatic gains, looking mainly at disaster-related activities affecting diplomacy rather than the reverse (Kelman 2006a). It is an area of study that has emerged from the umbrella scholarship of disaster research in the 2000s. It has since then not only gained momentum within its mother field but also stirred interest across a wide range of disciplines including geography, political science, and international affairs. Furthermore, the increasing academic attention for disaster diplomacy has been spurred by a few high-profile cases that recently made the media headlines. These include the drought spanning the border of Ethiopia and Eritrea in the early 2000s, the 2004 tsunami and its alleged impact on conflicts and peace processes in Sri Lanka and Indonesia, and hurricane Katrina in 2005 and its effects on US relationships with "enemy" countries.

Ilan Kelman has been the main proponent of the disaster diplomacy research. This book summarises more than ten years of research and careful documentation of events, processes, and diplomatic outcomes that were, until the publication of this book, compiled only in isolated papers and on the disaster diplomacy website: www.disasterdiplomacy.org. This book is therefore a welcome academic synthesis of the state of our knowledge on how disasters affect peace and conflicts. It is meant to be both a reference volume for academic libraries and a document dedicated to help policy makers and practitioners in making science-informed decisions when dealing with disasters in a conflict-torn region.

The book is small (174 pages inclusive of references), easy to read, and straightforward in its argument. It includes 12 short sections that flow well and in a logical manner. It thus caters well to a non-academic audience while still capturing the attention of the scholarly readership by the rigour and thoroughness of the argumentation—Ilan Kelman's trademark. The bibliography is rich and stems from an array of fields and subfields of research, although the author acknowledges a definite bias towards the "disaster" side of the topic at the relative detriment of its "diplomacy" counterpart.

The disaster diplomacy framework as presented in this book also neglects the broad field humanitarian studies, which would have provided interesting additional insights and theoretical framing. Many authors (e.g., de Waal 1997; Cuny 1999) have indeed addressed how long-term aid and short-term relief operations in time of famines or armed conflicts may exacerbate tensions or support peace. The *Do No Harm* approach suggested by Anderson (1999) may in fact very well constitute a proto-disaster diplomacy framework for policy makers and practitioners, which would deserve attention because it similarly draws upon a good range of case studies and empirical materials.

Still, this small book stands out by the comprehensiveness with which it addresses the topic under scrutiny. It provides the latest theoretical framing and interpretation of a large

set of empirical data. These include a significant range of case studies from all over the globe, which are all discussed in specific subsections. These examples cover a wide range of disaster diplomacy—international, intra-state, para-diplomacy, and environmental diplomacy. Some readers may regret that these case studies are not detailed but this lack of detail is the price to pay for a small and concise book that will likely speak to practitioners and policy makers who may not have the same appetite for details as academics.

In fact, the empirical materials supplied in this book provide ample evidence that the potential for disasters to foster peace should not be overestimated, nor it should be neglected. Kelman shows that disasters and post-disaster recovery offer a range of pathways for diplomacy but these are actually rarely pursued in the long term. Short-term gains in the immediate aftermath of a disaster, during relief operations, are indeed often overcome by long-lasting and structural social, economic, and political issues underpinning the conflict. In addition, when positive outcomes such as those following the 2004 tsunami in Indonesia have been observed, these are as much associated to pre-disaster negotiations as to the disaster itself. Disasters therefore serve as catalysts for diplomacy rather than key factors for initiating peace talks. In that sense, the present book debunks a myth often put forward by the media.

Disaster Diplomacy is not limited to the foregoing argument, which has, in fact, already been discussed in a series of papers by Kelman and others (e.g., Kelman and Koukis 2000; Kelman 2006a, b; Kelman and Conrich 2011). It advances the debate around disaster diplomacy by making concrete recommendations for policy and practice. Four key lessons that have already or may be taken into account for enhancing both disaster and aid policies and diplomacy are suggested. Those straightforward lessons include "be ready for assistance offers from enemies", "all diplomacy tracks can be useful", "disaster diplomacy operates at many levels" and "lessons should be implemented, not forgotten". Kelman provides an insightful discussion for each of these lessons through concrete examples of existing policies, as in the case of New Zealand. Here, though, reference to, and maybe integration of, Anderson's *Do No Harm* approach would have provided further practical insights for policy makers and practitioners providing aid in conflict-torn areas.

The book closes with a critical assessment of its limitations and those of the whole disaster diplomacy framework. Kelman notably confronts early criticisms raised by Yim et al. (2009, p. 291)—the lack of operational definition for disaster diplomacy, the difficulties in assessing success and failure, the absence of recommendations for policy, and training programme for practitioners. He suggests ways for overcoming some of these limitations, such as the use of quantitative approaches, while reflecting upon the actual shortcomings of the disaster diplomacy framework, especially its operational validity. In fact, the closing section of the book provides a clear and appealing agenda for further research to fill in these gaps in knowledge and practice. It particularly invites scholars of different disciplines as well as practitioners to engage in further research to overcome three main gaps: 1) to understand people's motivations and decision making in cases of disaster diplomacy, 2) to make disaster diplomacy actually work, and 3) expand academic knowledge beyond the field of disaster studies.

In summary, *Disaster Diplomacy* is a concise but excellent and stimulating book that provides a very useful synthesis of our current knowledge in a new area of research

within the field of disaster studies. Its format and scope further makes it relevant and helpful for policy makers and practitioners of disaster risk reduction, disaster management, humanitarian response, and international diplomacy.

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The Natural Hazards Center at the University of Colorado at Boulder plays a vital role in reducing the risks posed by natural, technological, and human-induced hazards. For almost thirty years the Hazards Center has served as a national and international clearinghouse of knowledge concerning the social science and policy aspects of hazards and we continue to advocate sustainability, interdisciplinary partnerships, and an all-hazards approach to the management of extreme events. Our basic goal is to strengthen communication among researchers, practitioners, policy makers, and other concerned individuals, and we focus on the collection and sharing of research and experience related to disaster mitigation, preparedness, response, and recovery. The Center publishes a wide variety of publications, often freely available on our Web site, ranging from works-in-progress to peer-reviewed studies, with the intent of reaching as wide an audience as possible. These publications include the ***Natural Hazards Observer***, ***Disaster Research*** (e-newsletter), the ***Natural Hazards Review*** (in cooperation with the American Society of Civil Engineers), full-length research studies (monographs), working papers, and special publications such as ***Beyond September 11: An Account of Post-Disaster Research***. Information about these publications as well as other Hazards Center projects, such as the Disaster Grads listserv for students interested in hazards and disasters, our extensive library and its online searchable database ***HazLit***, and the Quick Response Research Program, is available on the Web at:

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